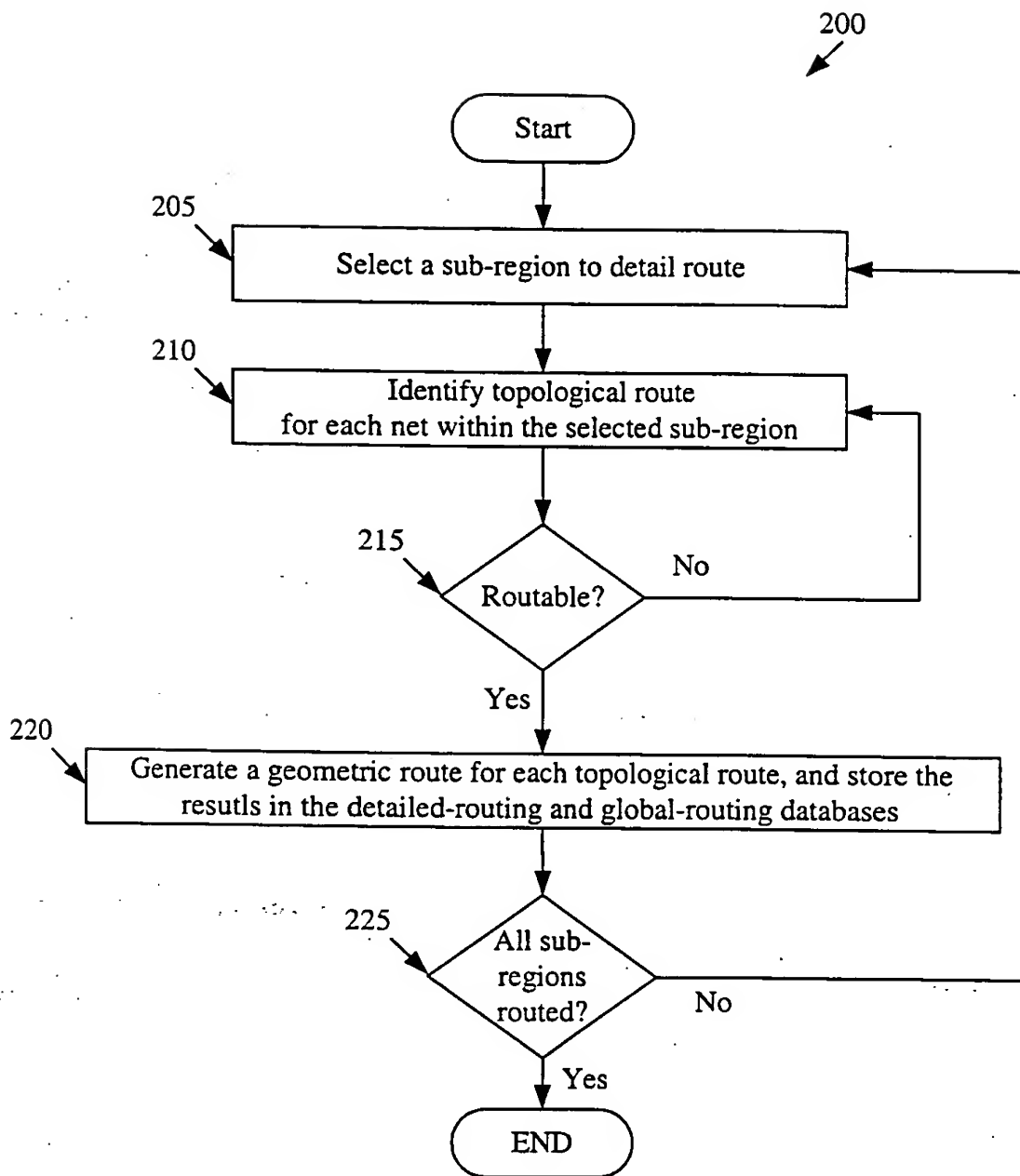


Figure 1



**Figure 2**

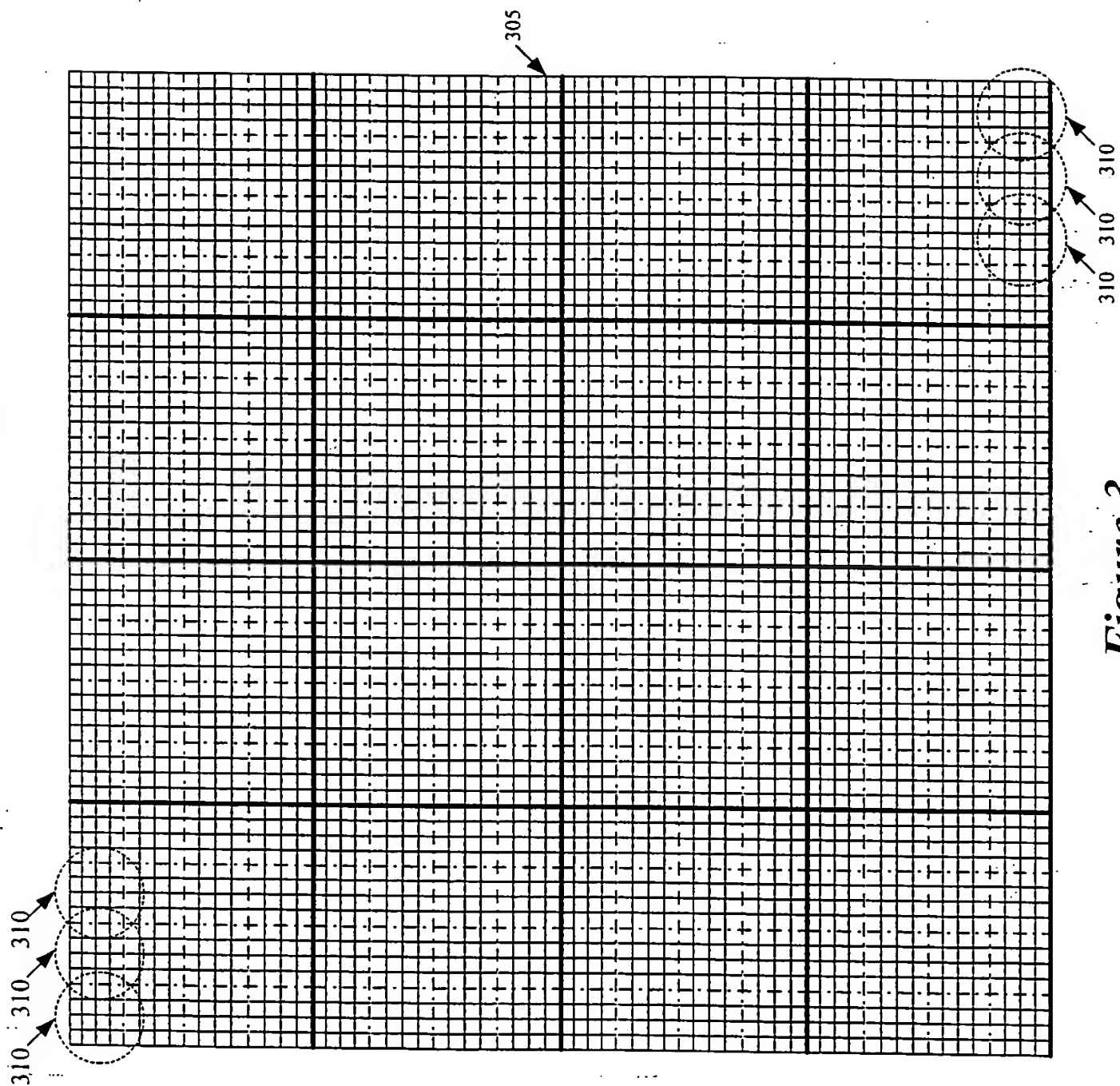


Figure 3

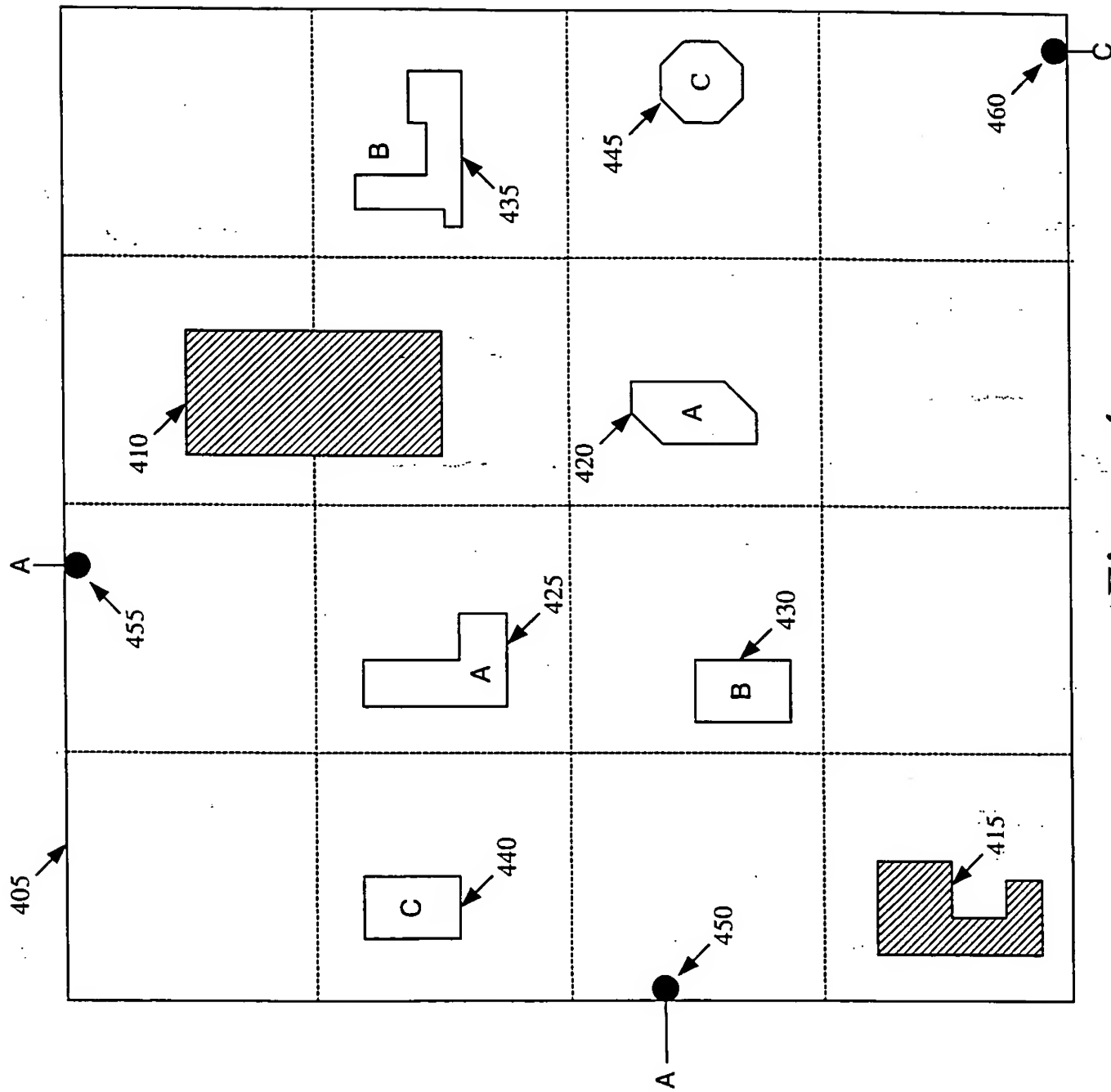
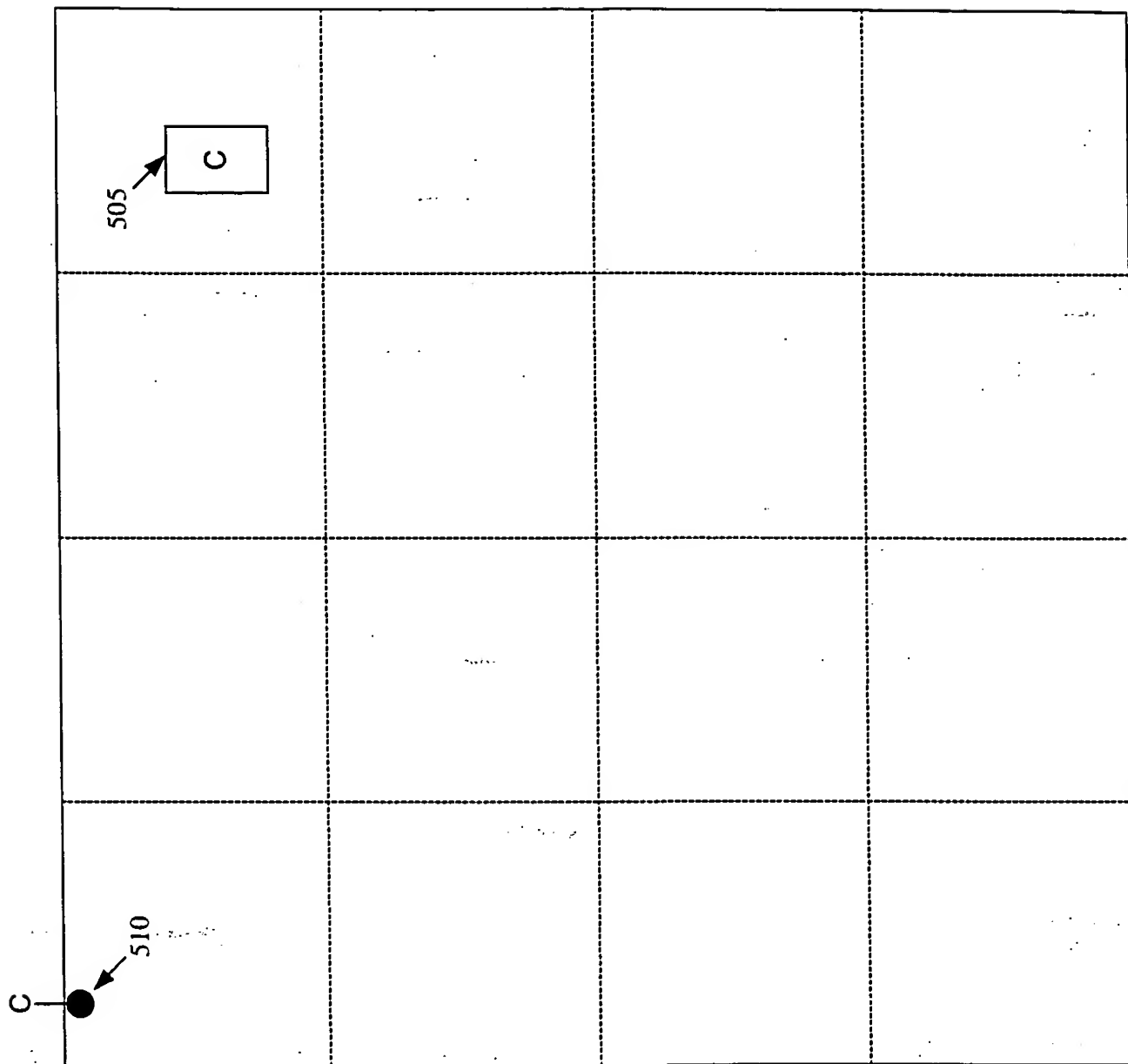


Figure 4



*Figure 5*

```

-List of Geometries
  --Each Geometry including a sequence of points & layer assignment
-Bounding box of the region
-Array of layer properties
  --Minimum wire size
  --Minimum spacing
  --Via sizes
  --Cost/Unit
-Netlist specifying a number of nets
  --Each net specifying a set of pins
    --Each pin specifying a set of ports
    --Each port specifying a set of geometries
  
```

*Figure 6*

```

-List of Geometries
  --Each Geometry including a sequence of points & layer assignment
    --List of connection nodes inside each pin geometry
-Bounding box of the region
-Array of layer properties
  --Minimum wire size
  --Minimum spacing
  --Via sizes
  --Cost/Unit
-Netlist specifying a number of nets
  --Each net specifying a set of pins
    --Each pin specifying a set of ports
      --Each port specifying a set of geometries
-For each layer, a graph specifying
  --Nodes
  --Edges
  --Faces
  
```

*Figure 7*

Face
<ul style="list-style-type: none"> <li>-Reference to 3 edges</li> <li>-Reference to 3 nodes</li> <li>-Up to two references for up to two face item</li> </ul>

800

Edge
<ul style="list-style-type: none"> <li>-Two references for up to two faces of the edge</li> <li>-Capacity</li> <li>-Flow</li> <li>-Constrained</li> <li>-Linked list of items on the edge starting with one of the edge's nodes and ending with its other node</li> </ul>

900

Figure 8

Figure 9

Node
<ul style="list-style-type: none"> <li>-Net Identifier</li> <li>-One or more planar-path references to adjacent topological items in the same planar path</li> <li>-A pair of via-path references to up and down topological via items</li> <li>-A references to list of edges connected to the node</li> <li>-For each edge, an edge reference to the next or previous topological item on the edge</li> <li>-A reference to the geometry of the node</li> <li>-Vertex number identifying the vertex of the geometry</li> <li>-Location of the node</li> </ul>

1000

Figure 10

Edge Item
<ul style="list-style-type: none"> <li>-Reference to its edge</li> <li>-Net Identifier</li> <li>-A pair of planar-path references to adjacent topological items in the same planar path</li> <li>-A pair of edge references to the next and previous topological item on the edge</li> </ul>

1100

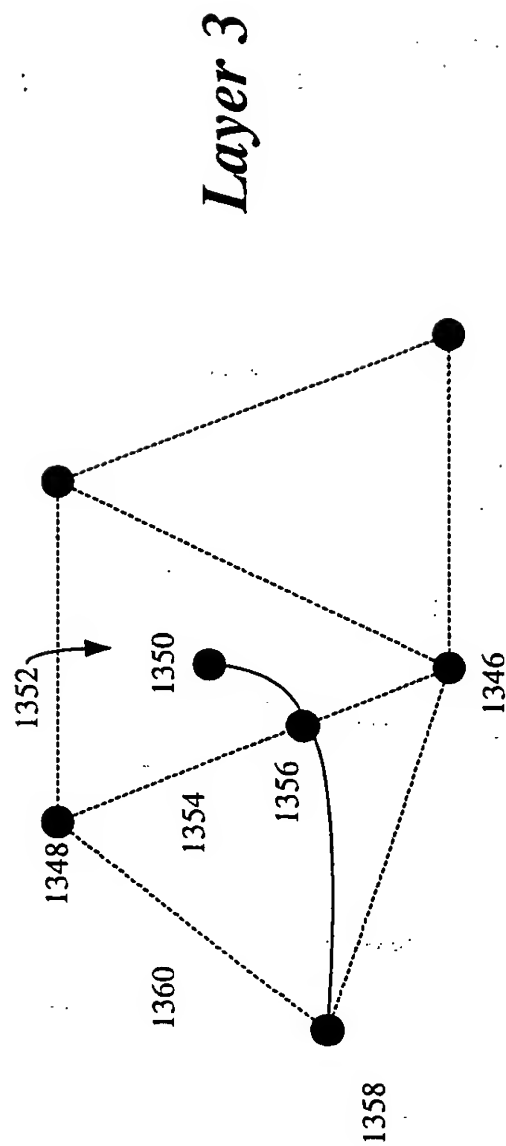
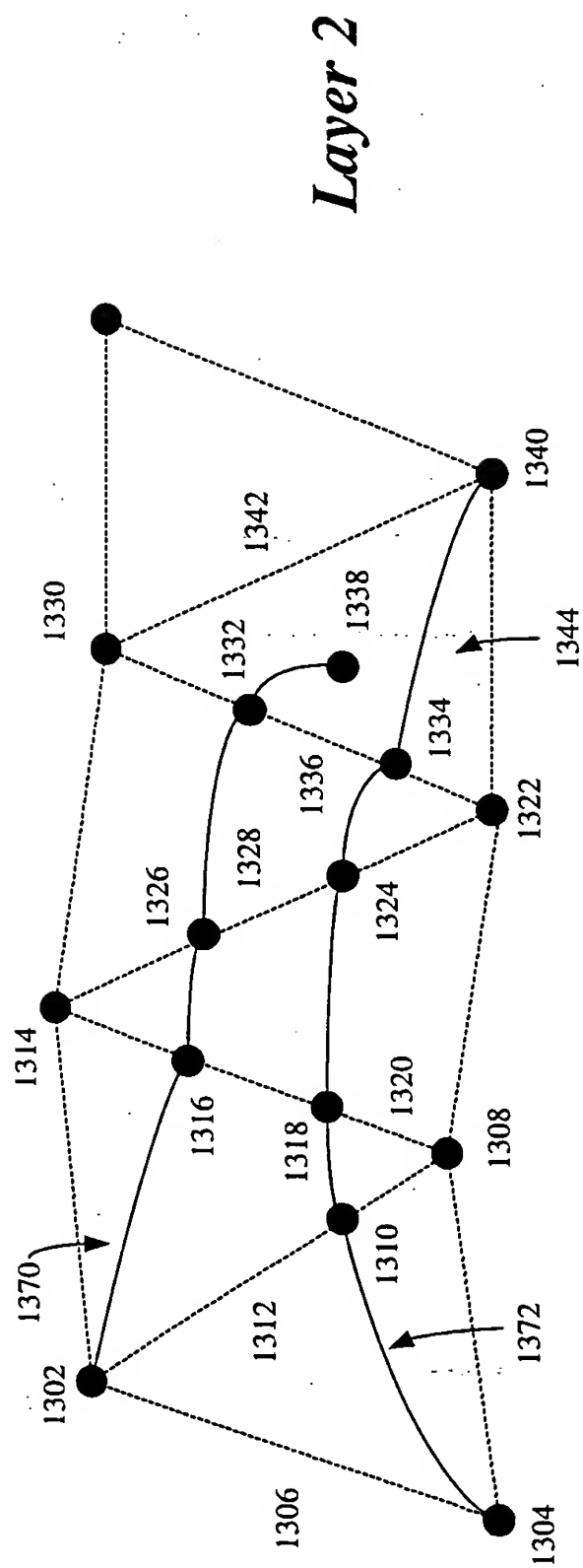
Figure 11

Face Item
<ul style="list-style-type: none"> <li>-Reference to its face</li> <li>-Net Identifier</li> <li>-Up to 3 planar-path references for adjacent topological items in the same planar path</li> <li>-A pair of via-path references for up and down topological via items</li> <li>-Bounding polygon that defines legal face item locations</li> <li>-Constraining Points and Distances</li> </ul>

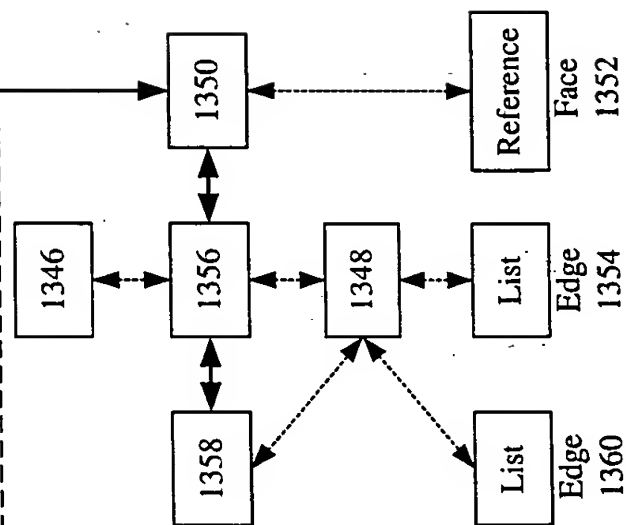
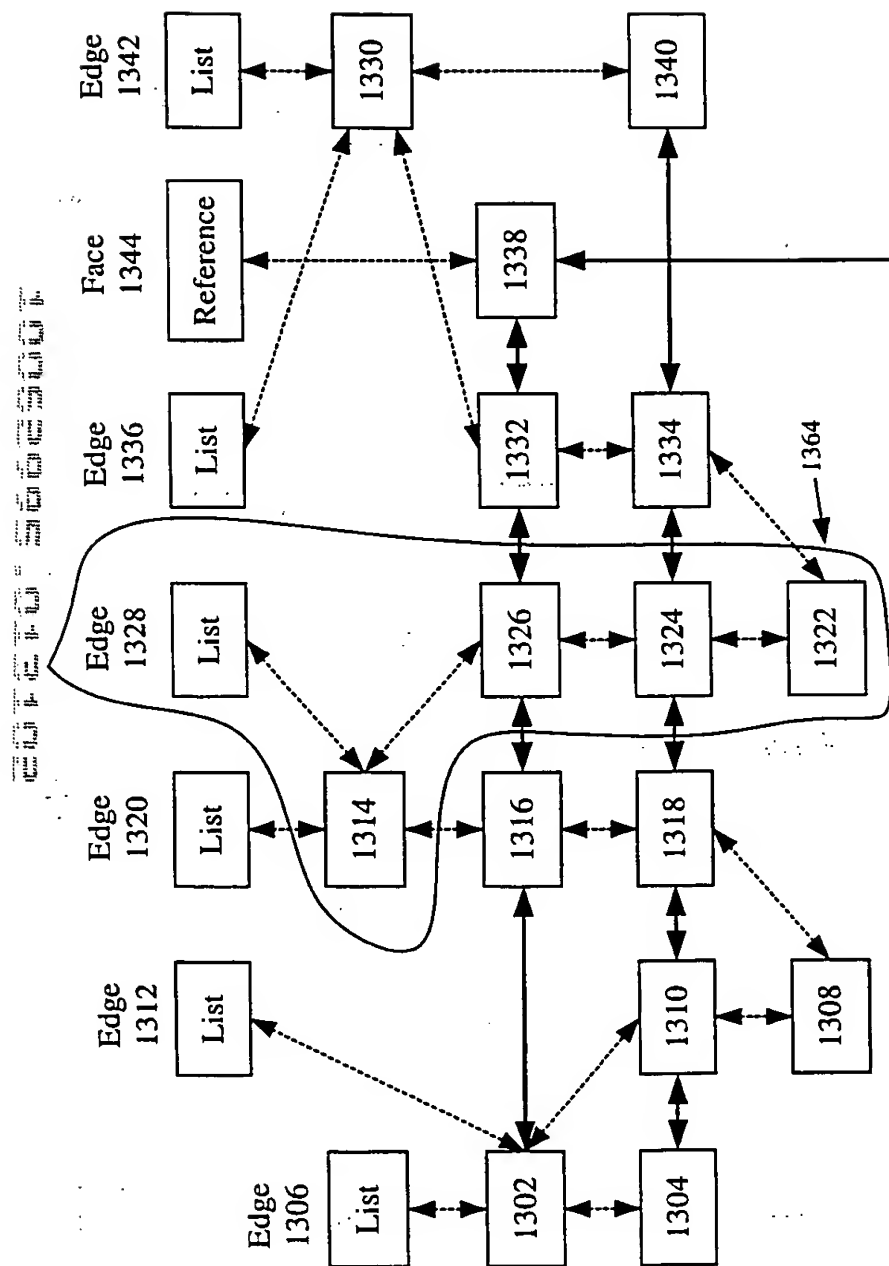
1200

Figure 12

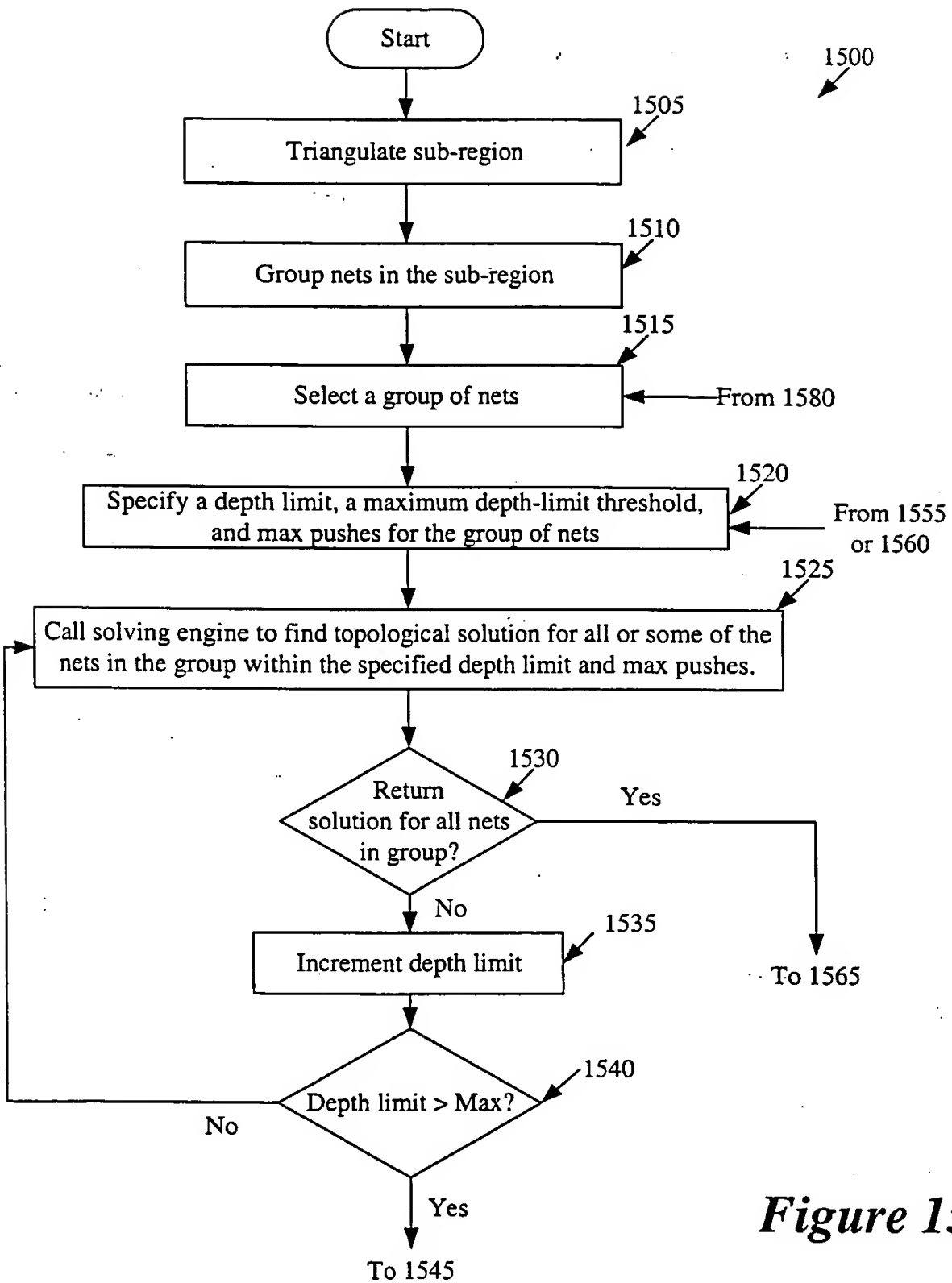




**Figure 13**

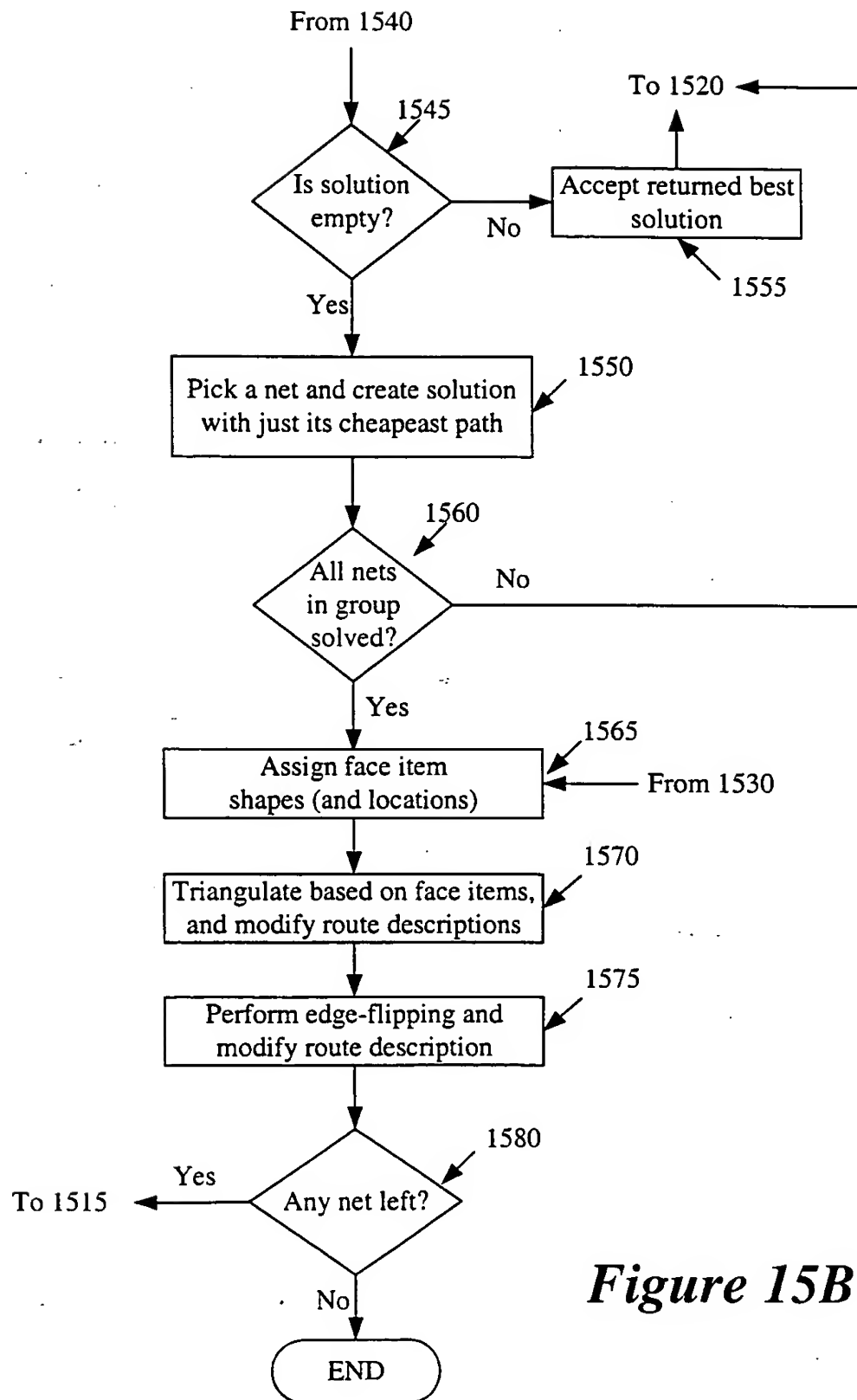


## Figure 14

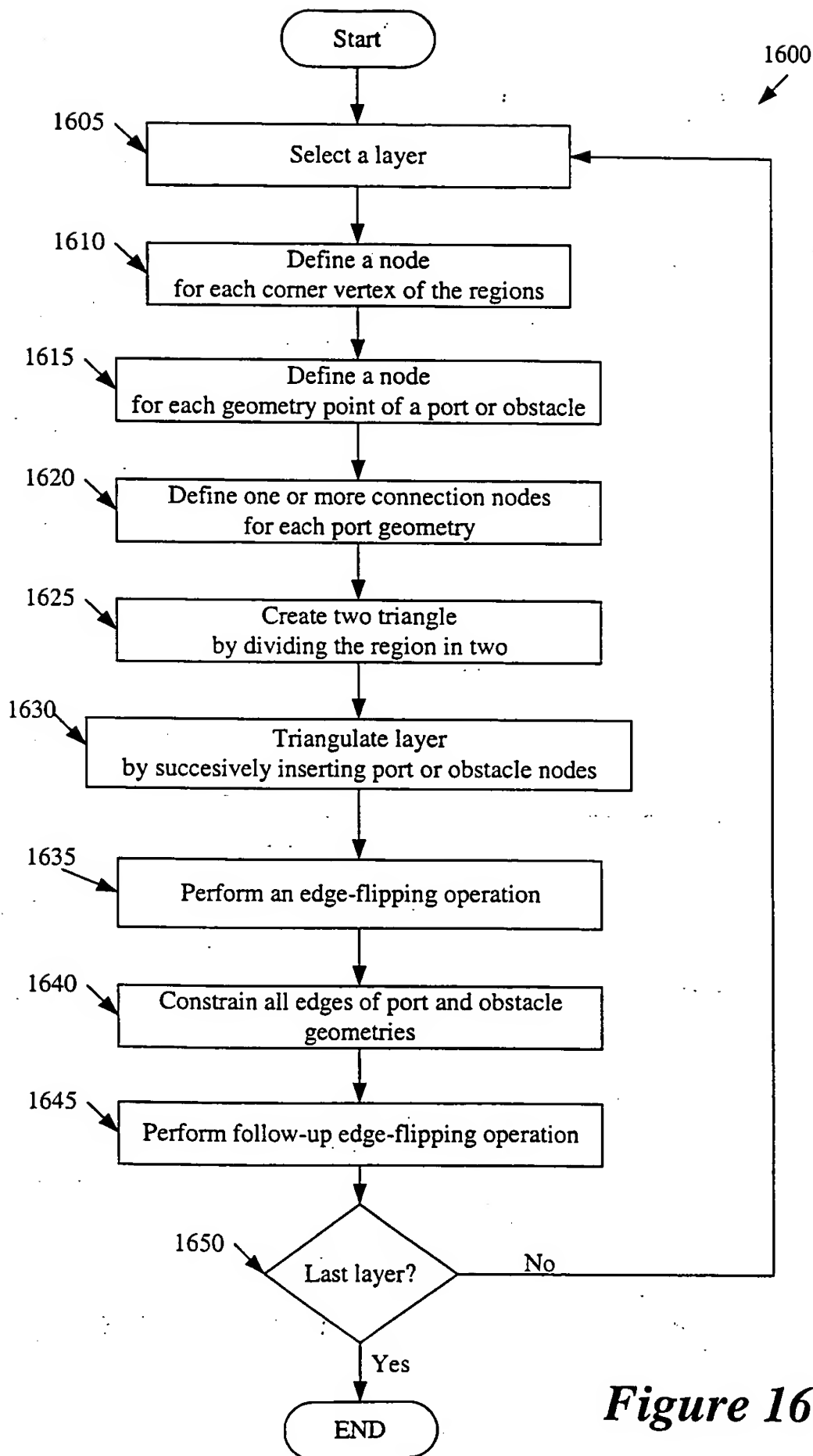


**Figure 15A**

**Figure 15:** Figure 15A  
Figure 15B



**Figure 15B**



**Figure 16**

CELL SEQUENCE

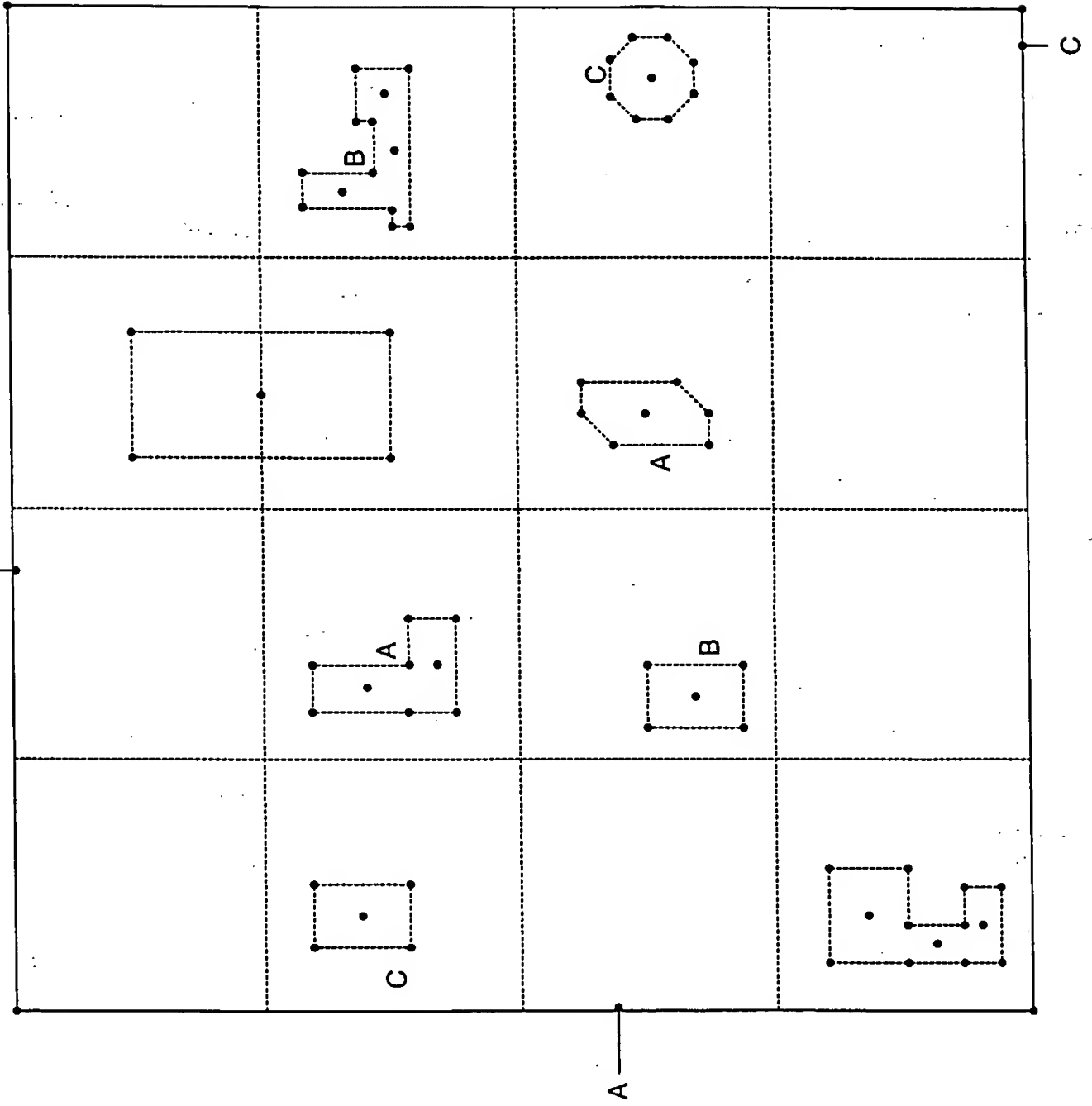
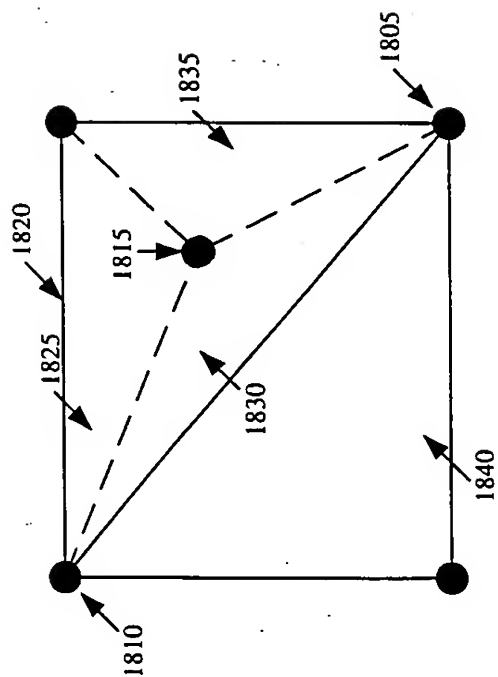
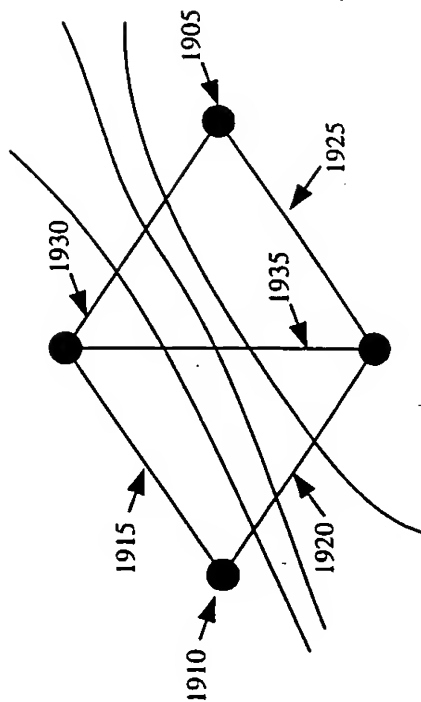


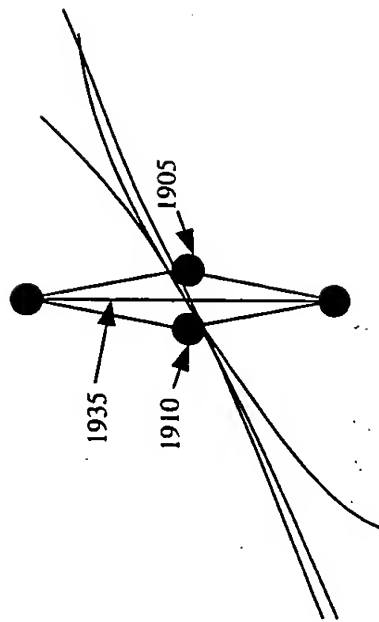
Figure 17



*Figure 18*



*Figure 19*



*Figure 20*

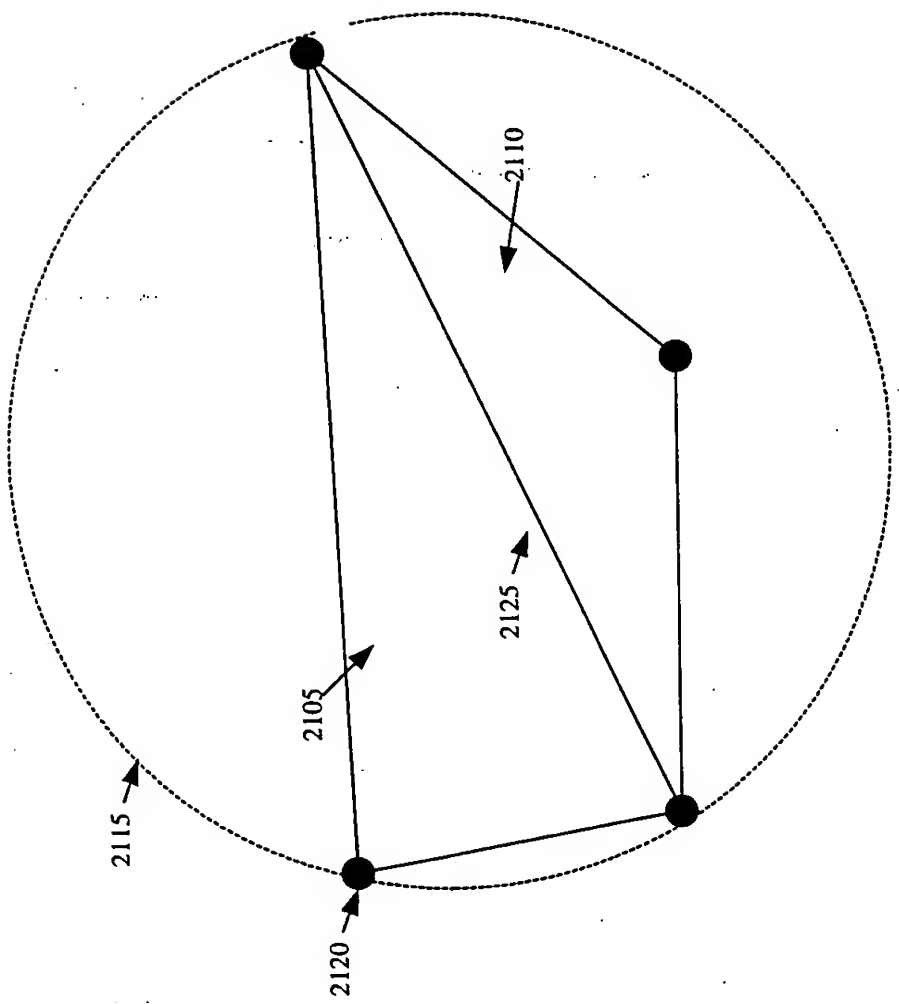


Figure 21

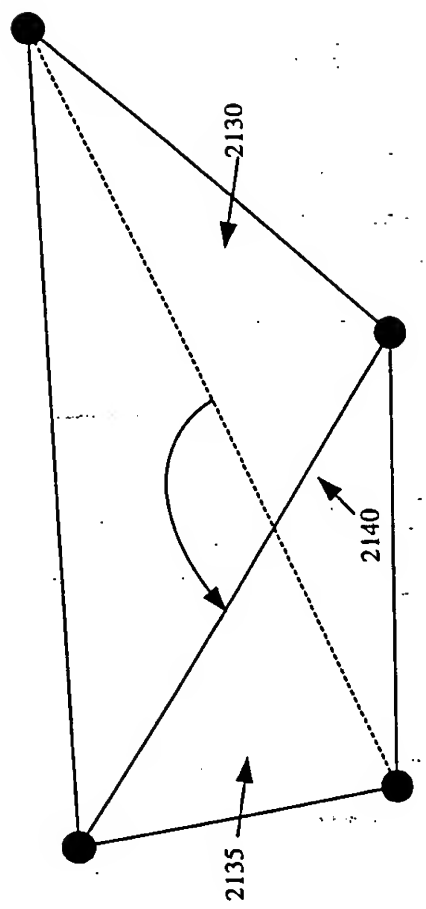


Figure 22



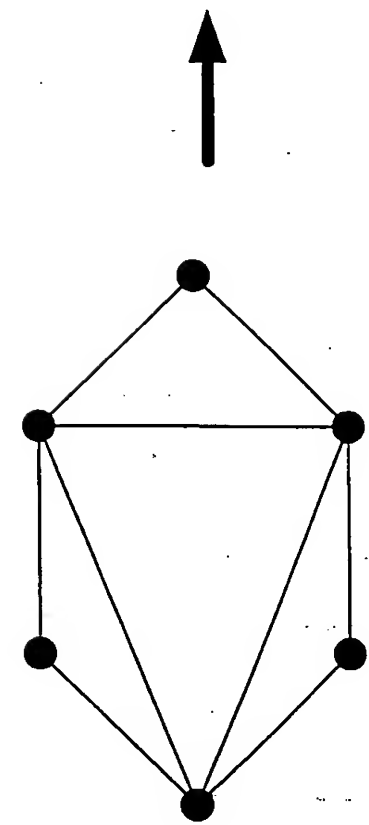
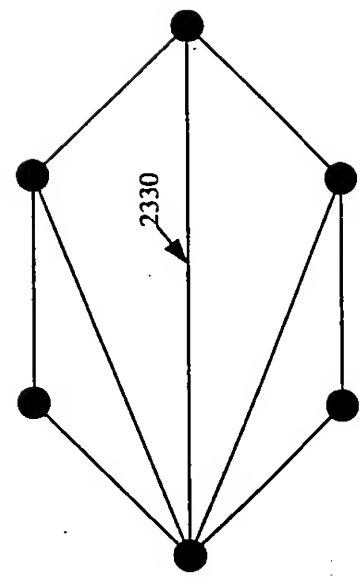
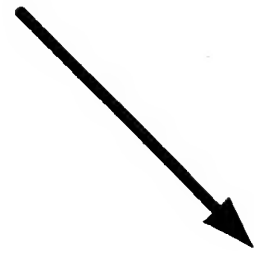
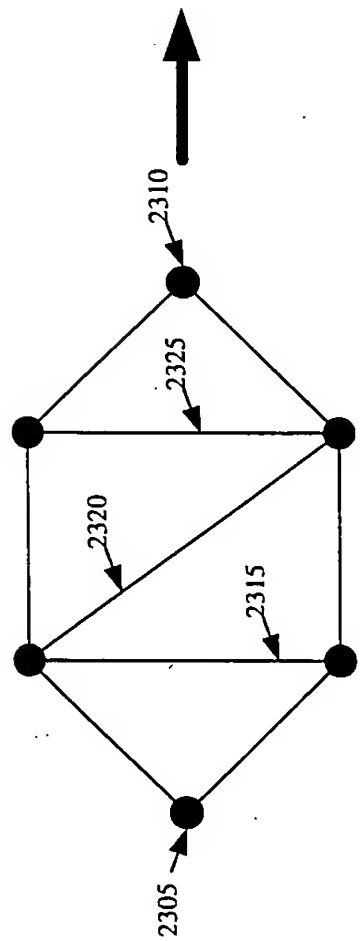
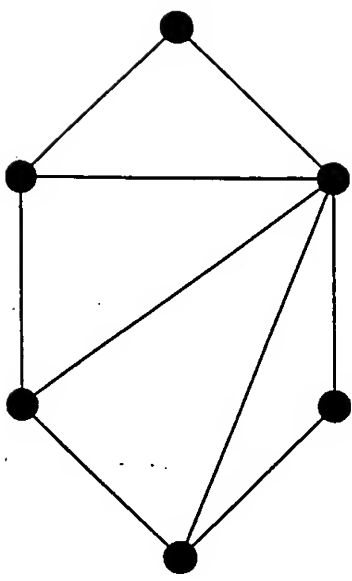
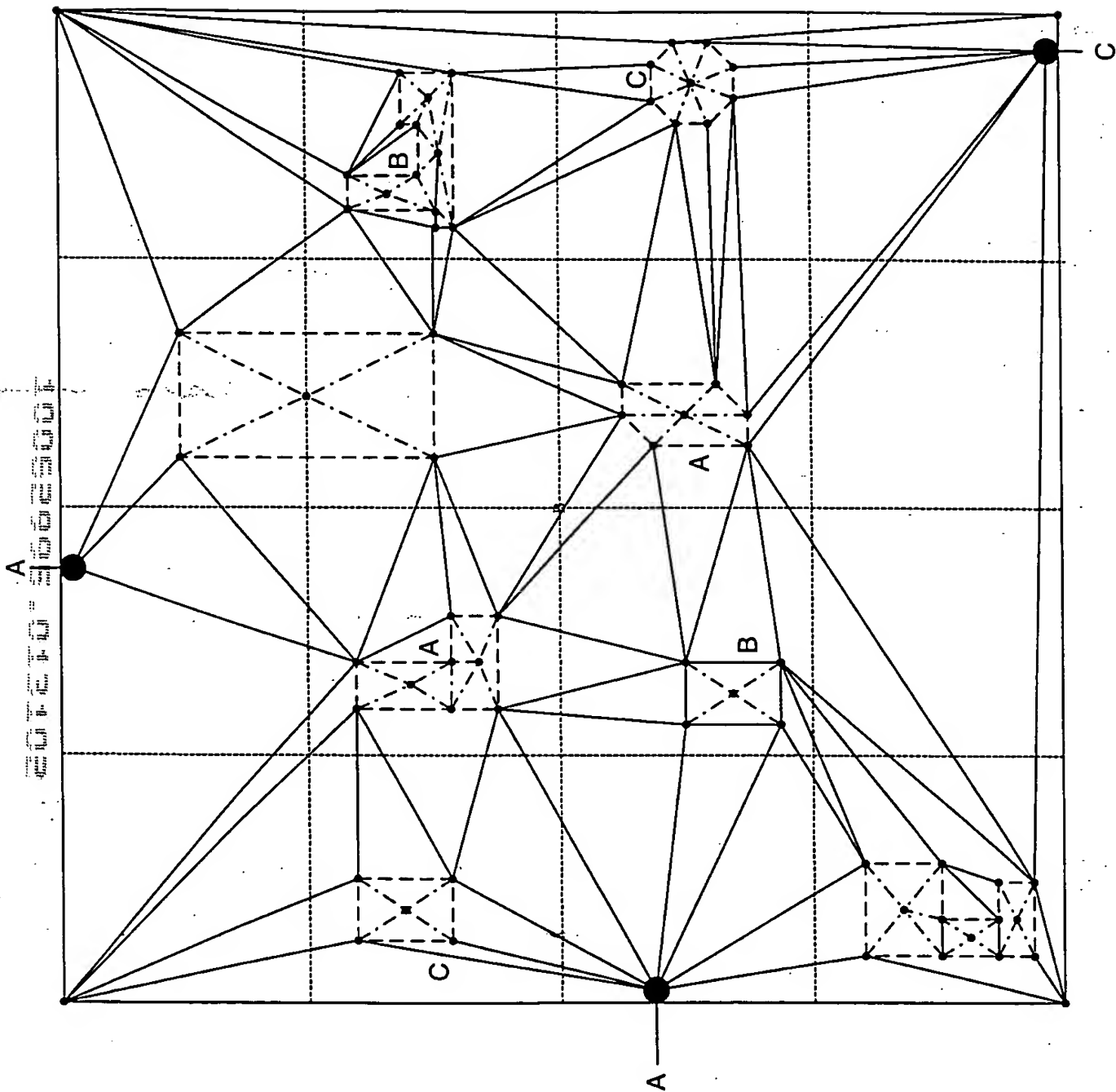
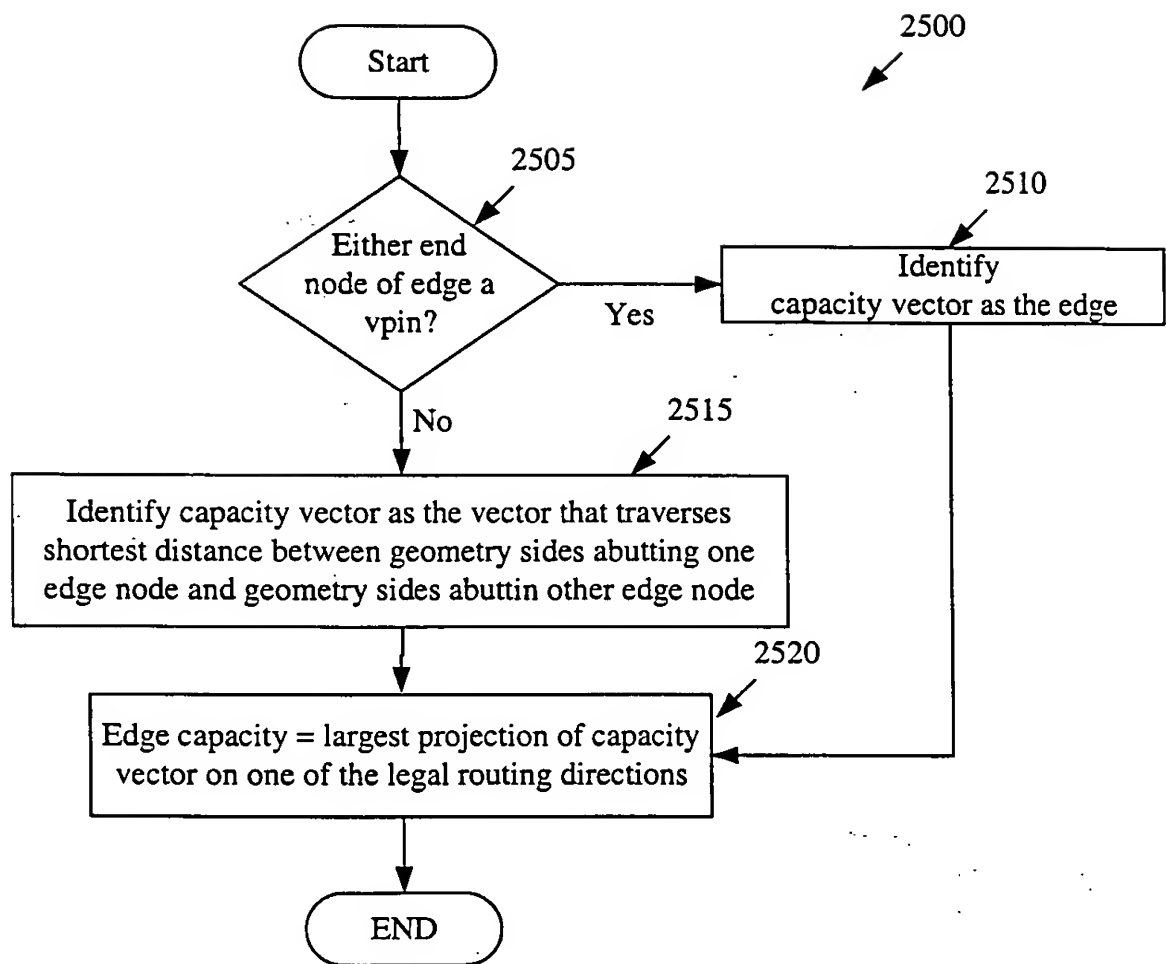


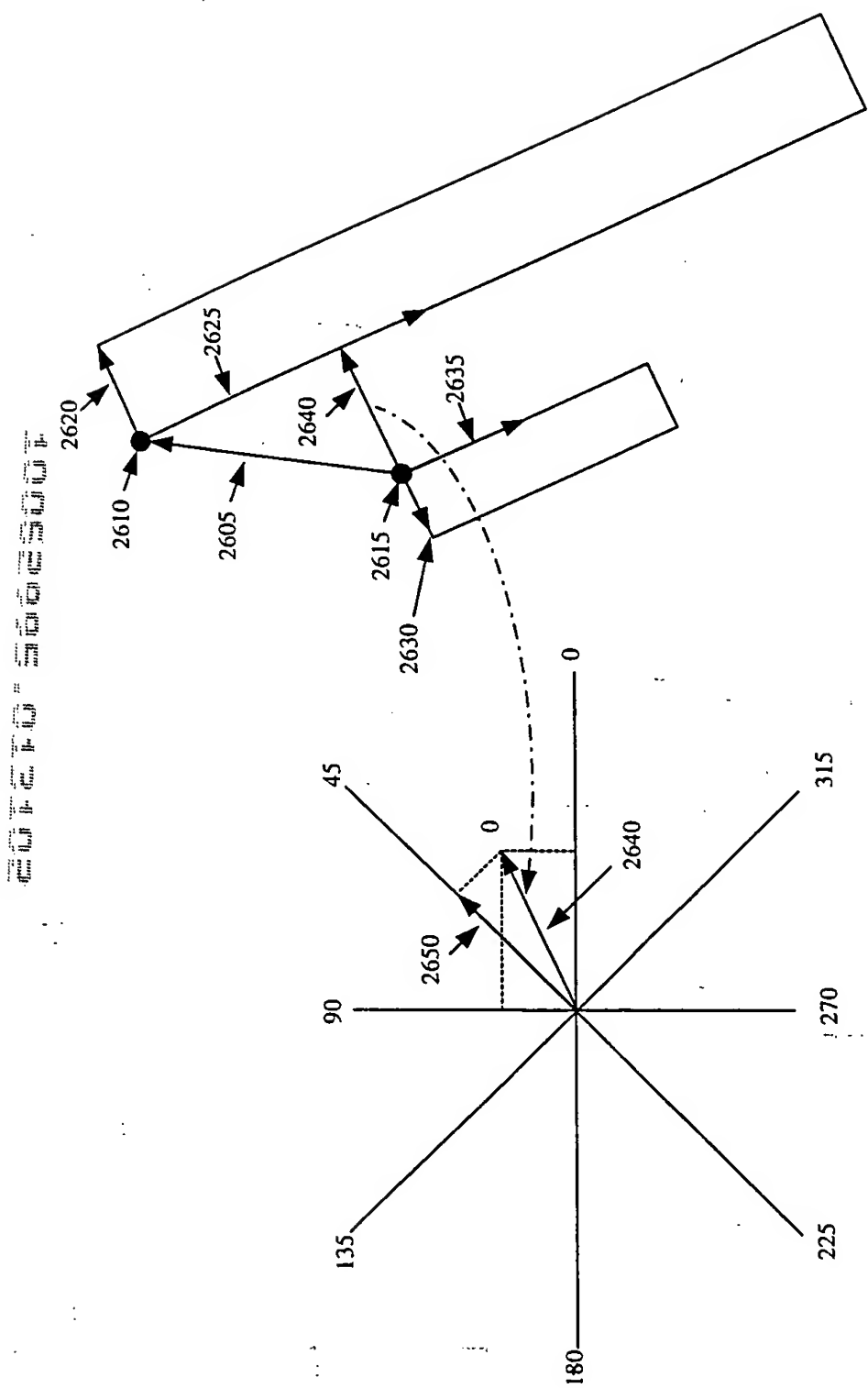
Figure 23



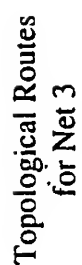
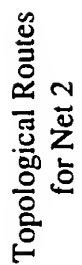
*Figure 24*



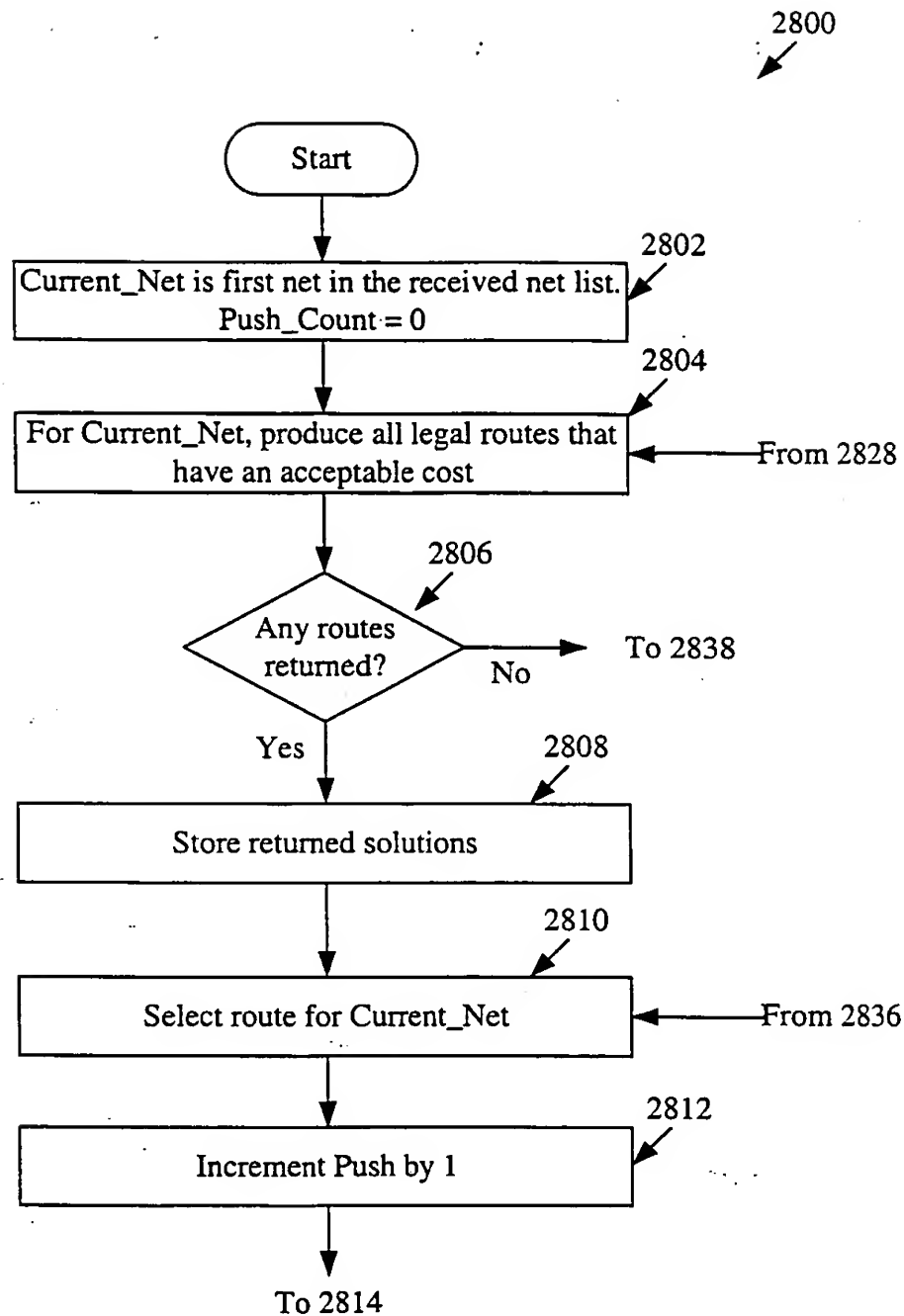
**Figure 25**



**Figure 26**

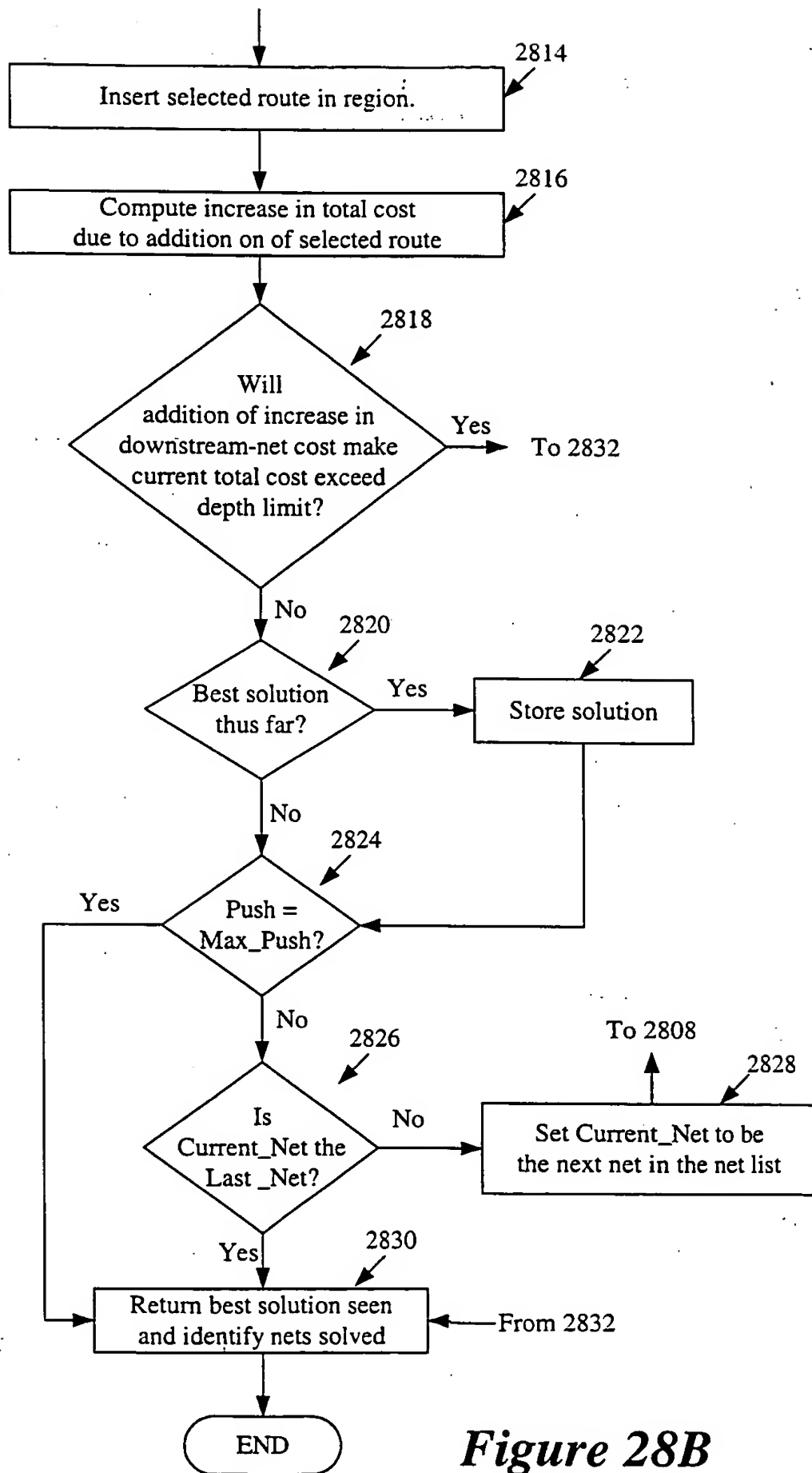


**Figure 27**

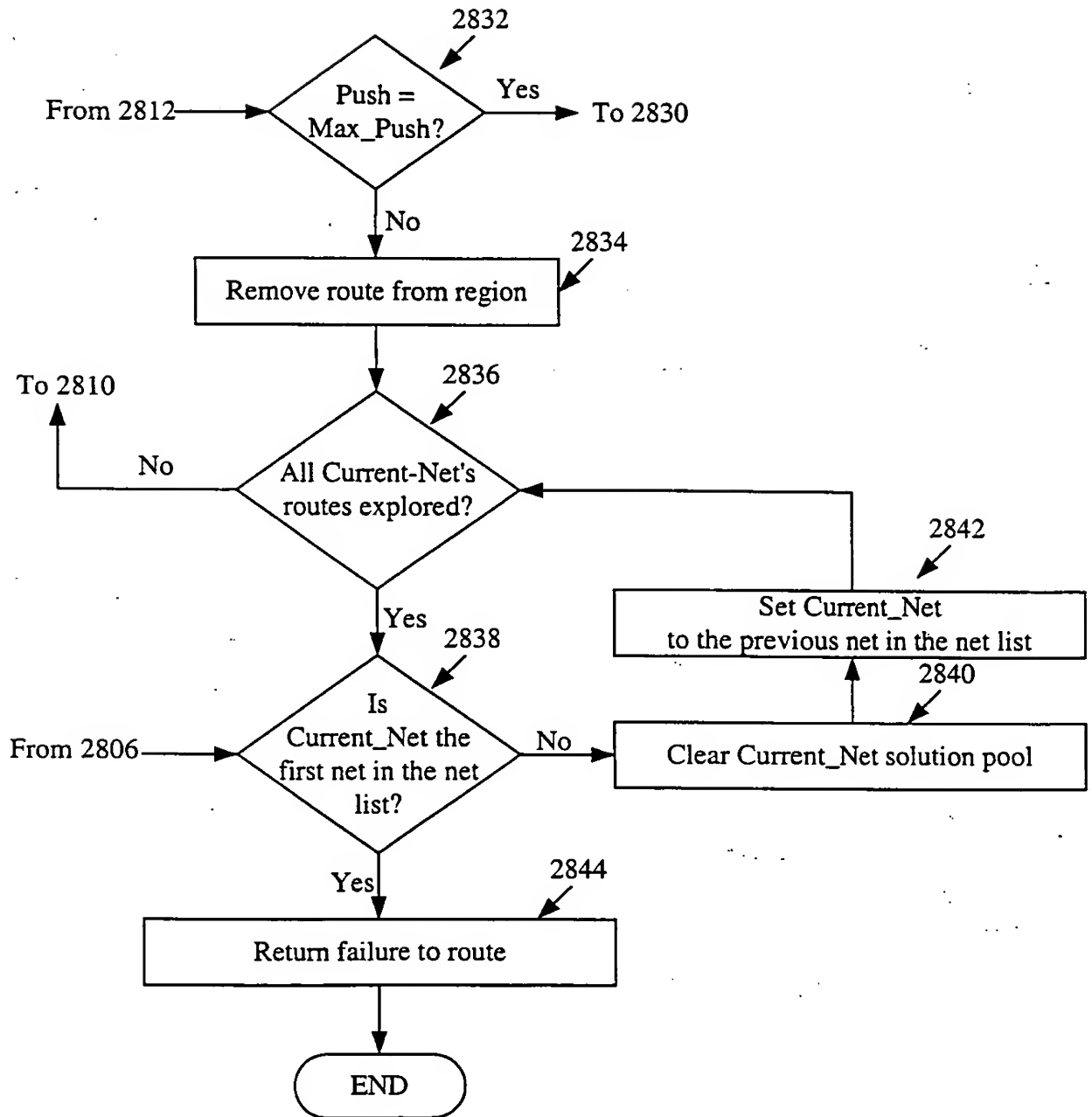


**Figure 28A**

**Figure 28:** Figure 28A  
Figure 28B  
Figure 28C

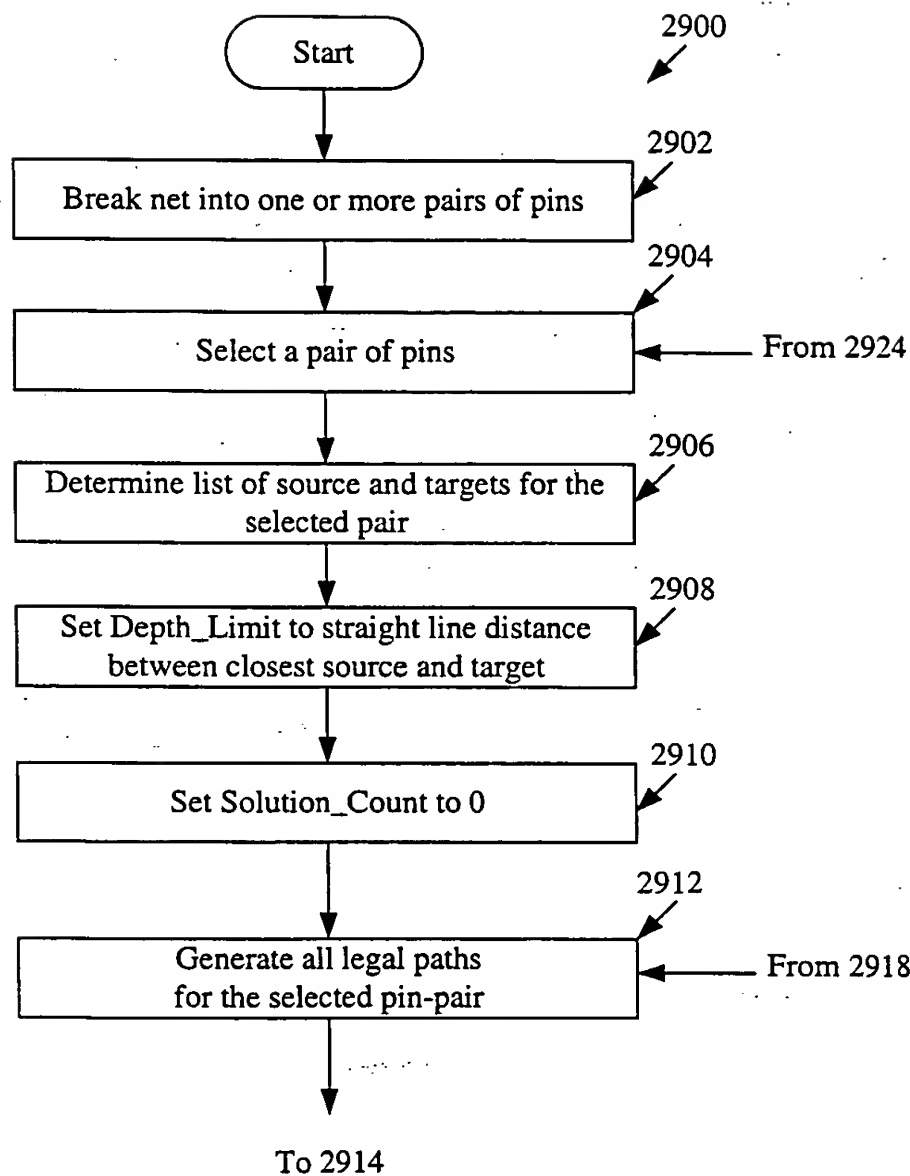


**Figure 28B**



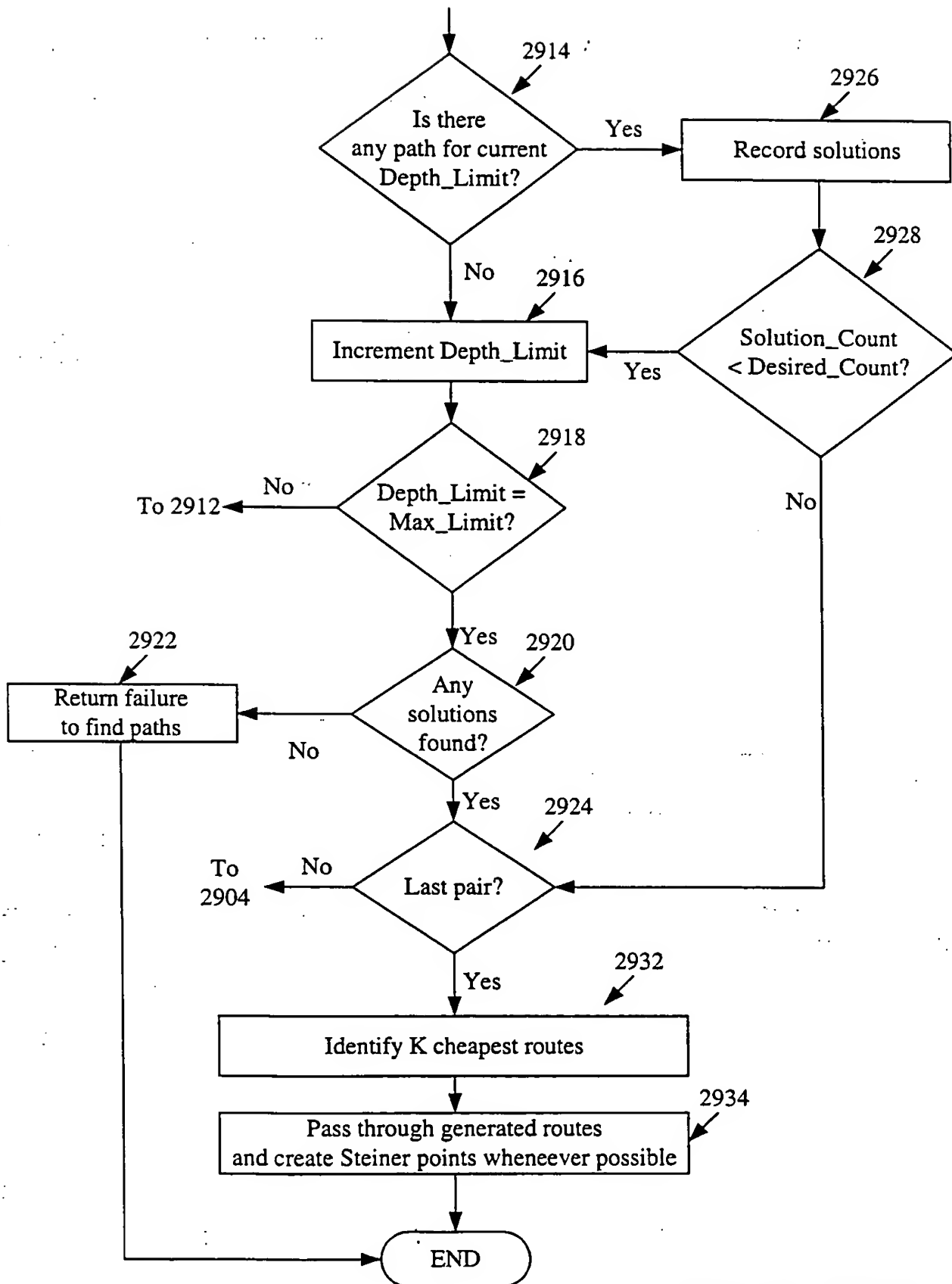
*Figure 28C*





**Figure 29A**

**Figure 29:**  $\frac{\text{Figure 29A}}{\text{Figure 29B}}$



**Figure 29B**

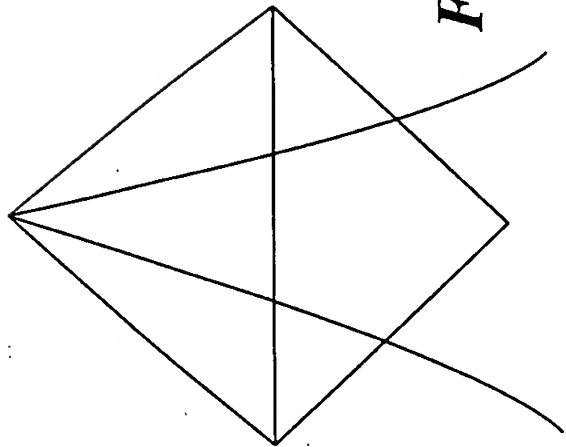


Figure 30A

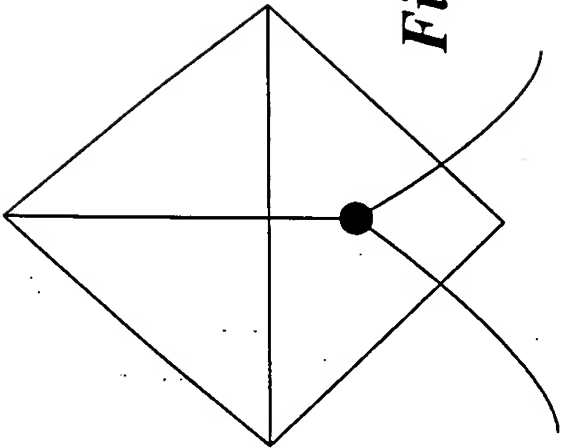


Figure 30B

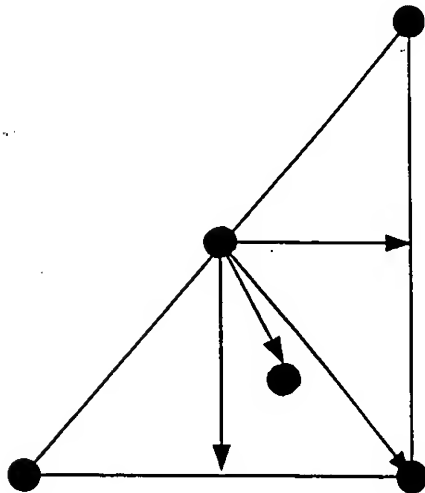


Figure 32

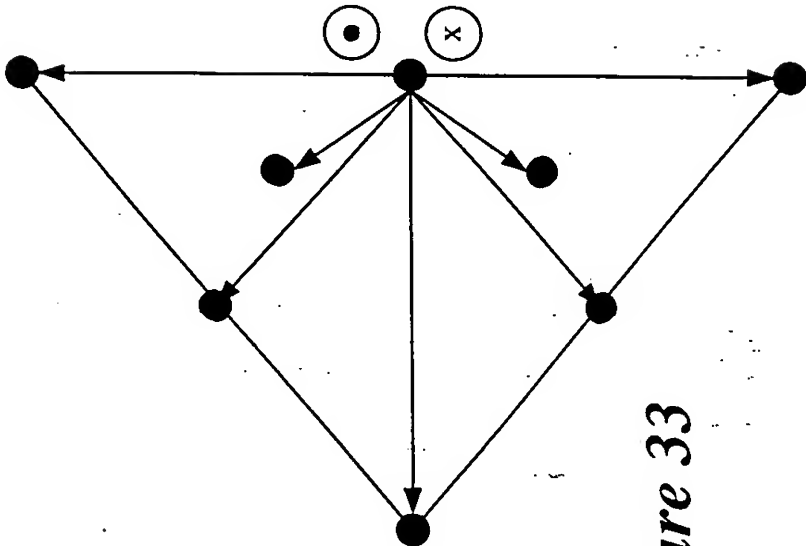


Figure 33

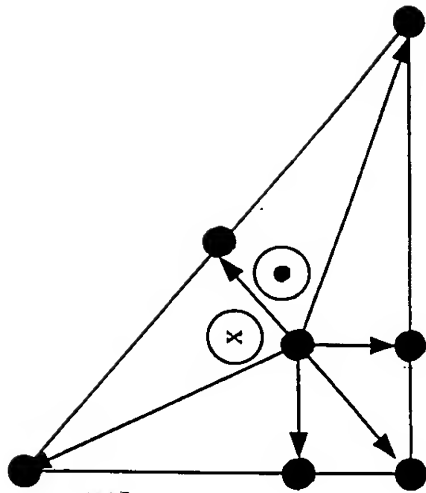
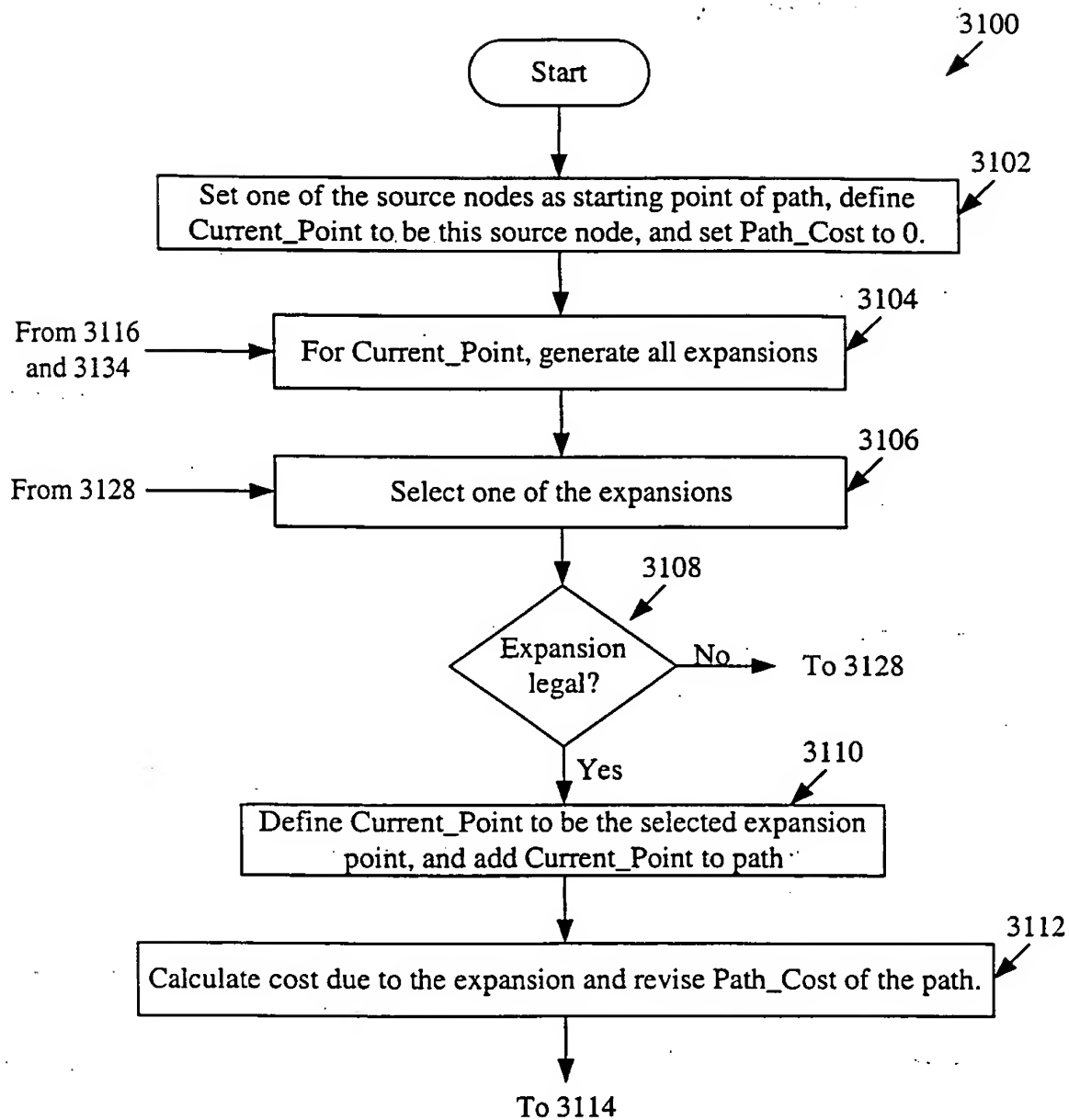
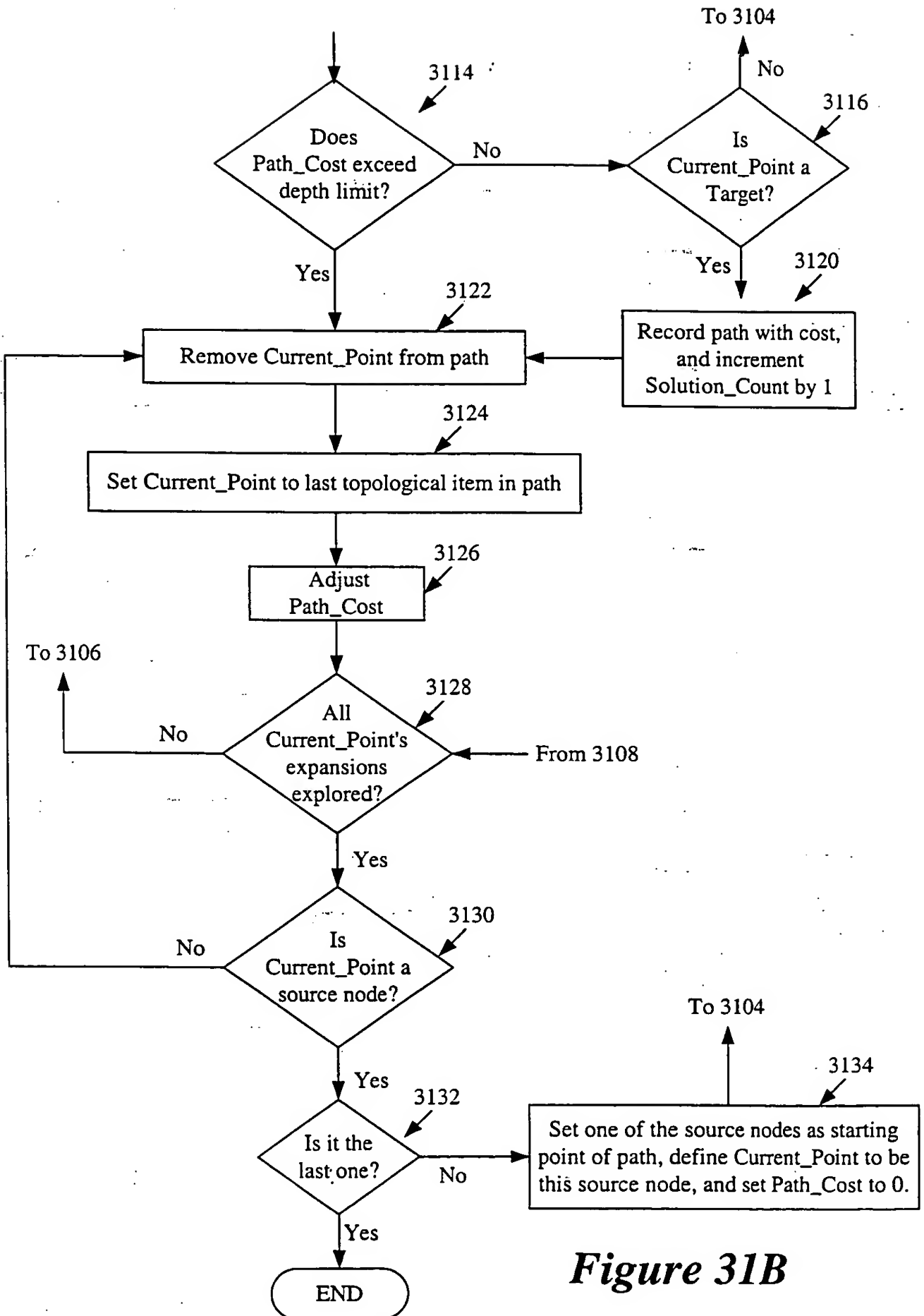


Figure 34



**Figure 31A**

**Figure 31:**  $\frac{\text{Figure 31A}}{\text{Figure 31B}}$



**Figure 31B**

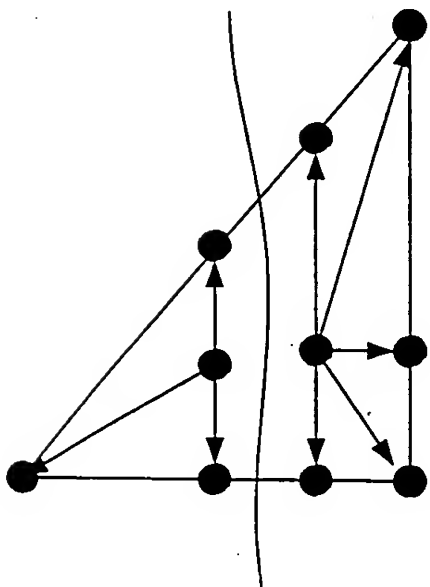


Figure 35

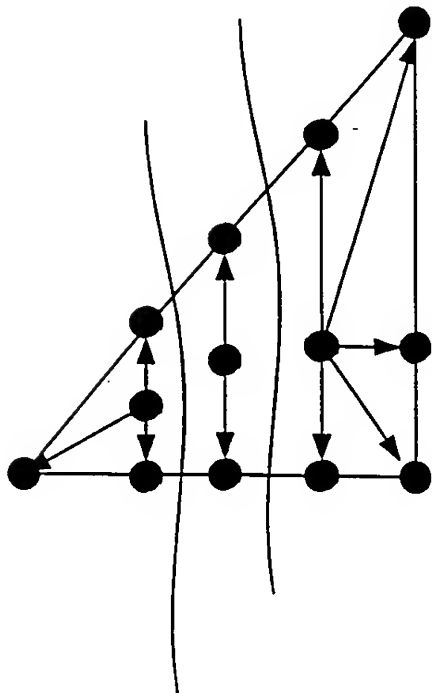


Figure 36

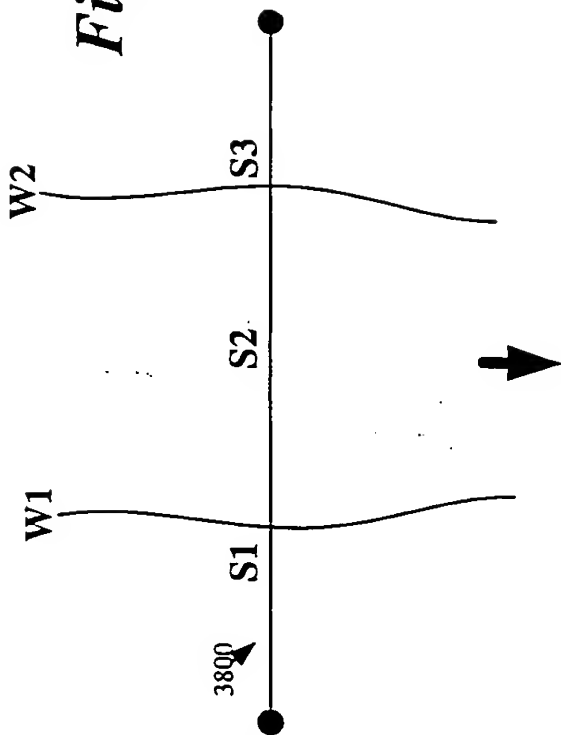


Figure 38A

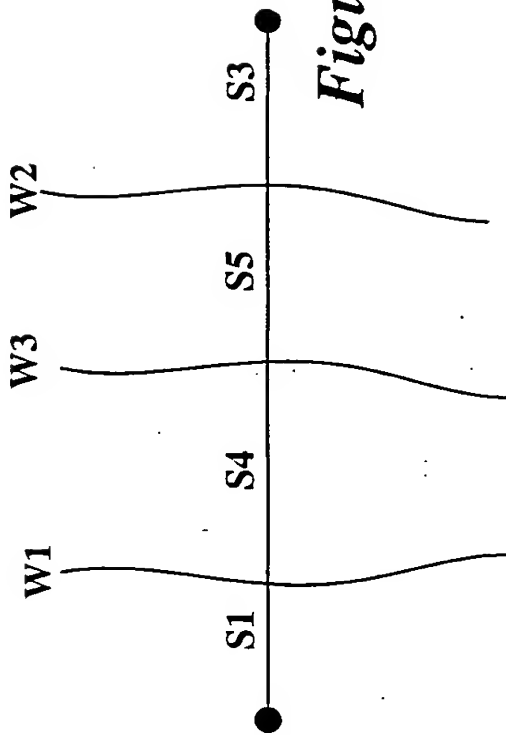
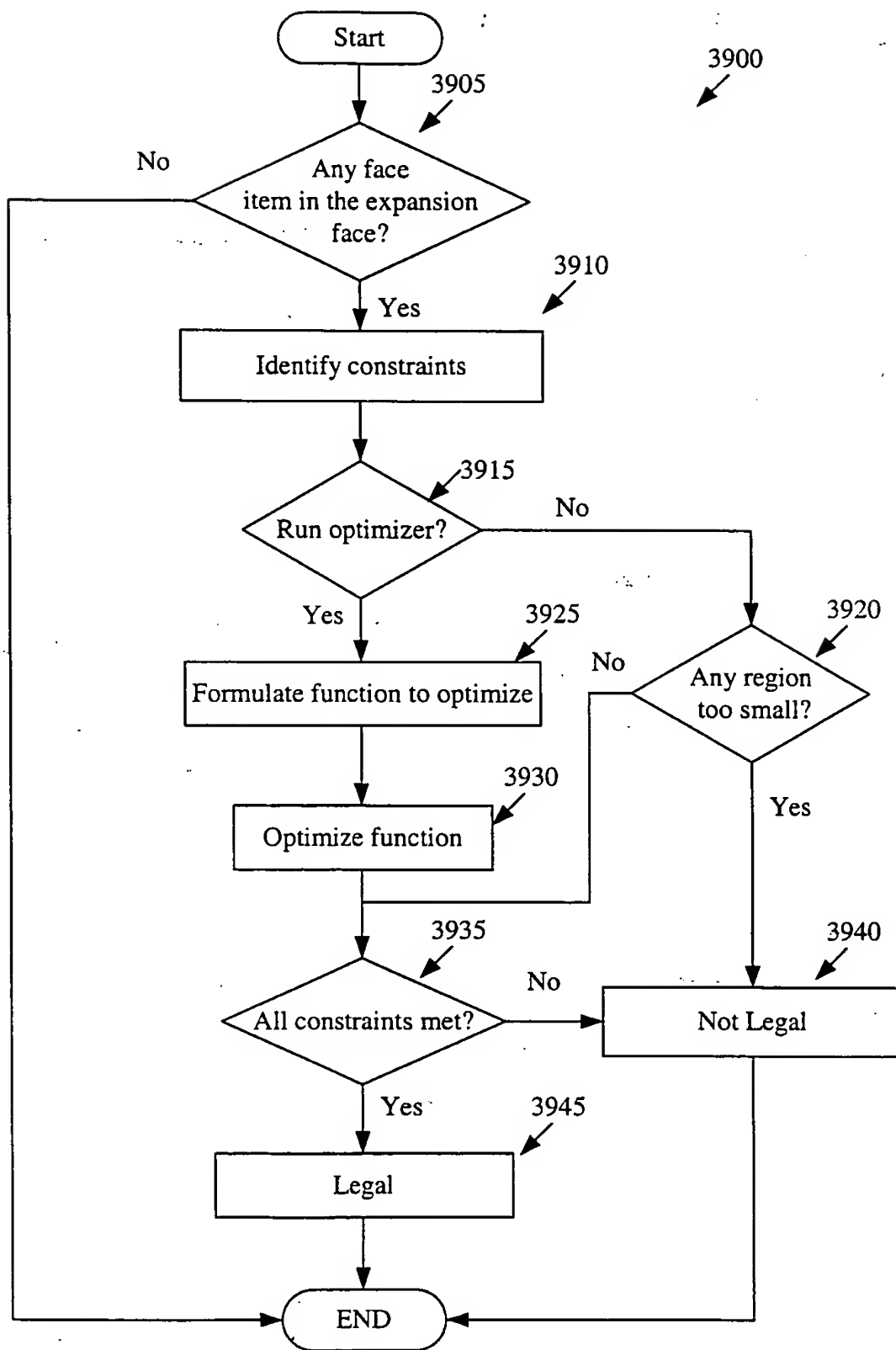


Figure 38B

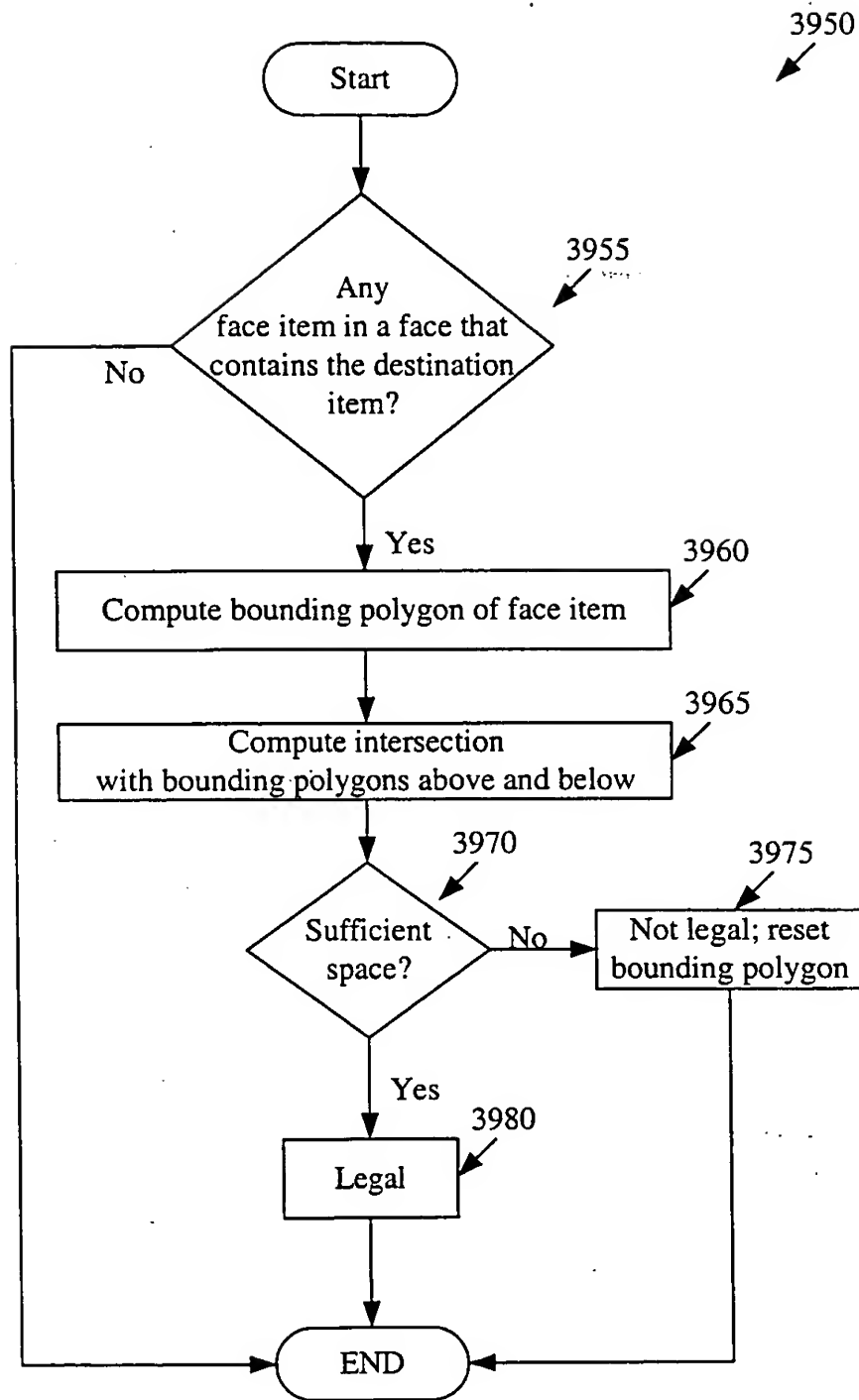
To: From:		Node	Face Item	Edge Item
Node	Node	<ul style="list-style-type: none"><li>• Planarity</li><li>• Vias</li></ul>	<ul style="list-style-type: none"><li>• Vias</li></ul>	<ul style="list-style-type: none"><li>• Planarity</li><li>• Vias</li><li>• Edge</li><li>• Capacity</li></ul>
	Face Item	<ul style="list-style-type: none"><li>• Vias</li></ul>	<ul style="list-style-type: none"><li>• Vias</li></ul>	<ul style="list-style-type: none"><li>• Vias</li><li>• Edge</li><li>• Capacity</li></ul>
	Edge Item	<ul style="list-style-type: none"><li>• Planarity</li><li>• Vias</li></ul>	<ul style="list-style-type: none"><li>• Vias</li></ul>	<ul style="list-style-type: none"><li>• Planarity</li><li>• Vias</li><li>• Edge</li><li>• Capacity</li></ul>

Figure 37

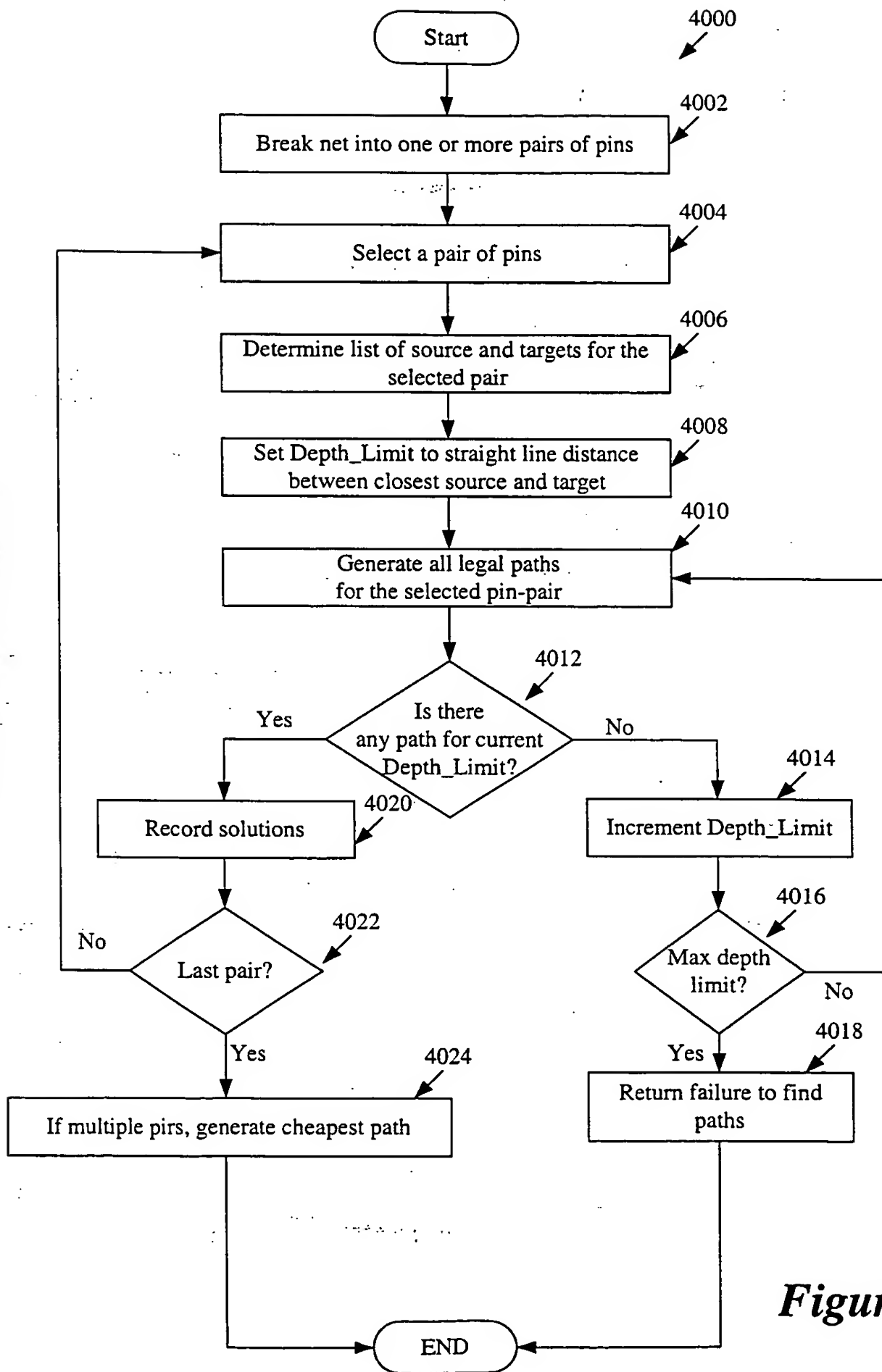


**Figure 39A**

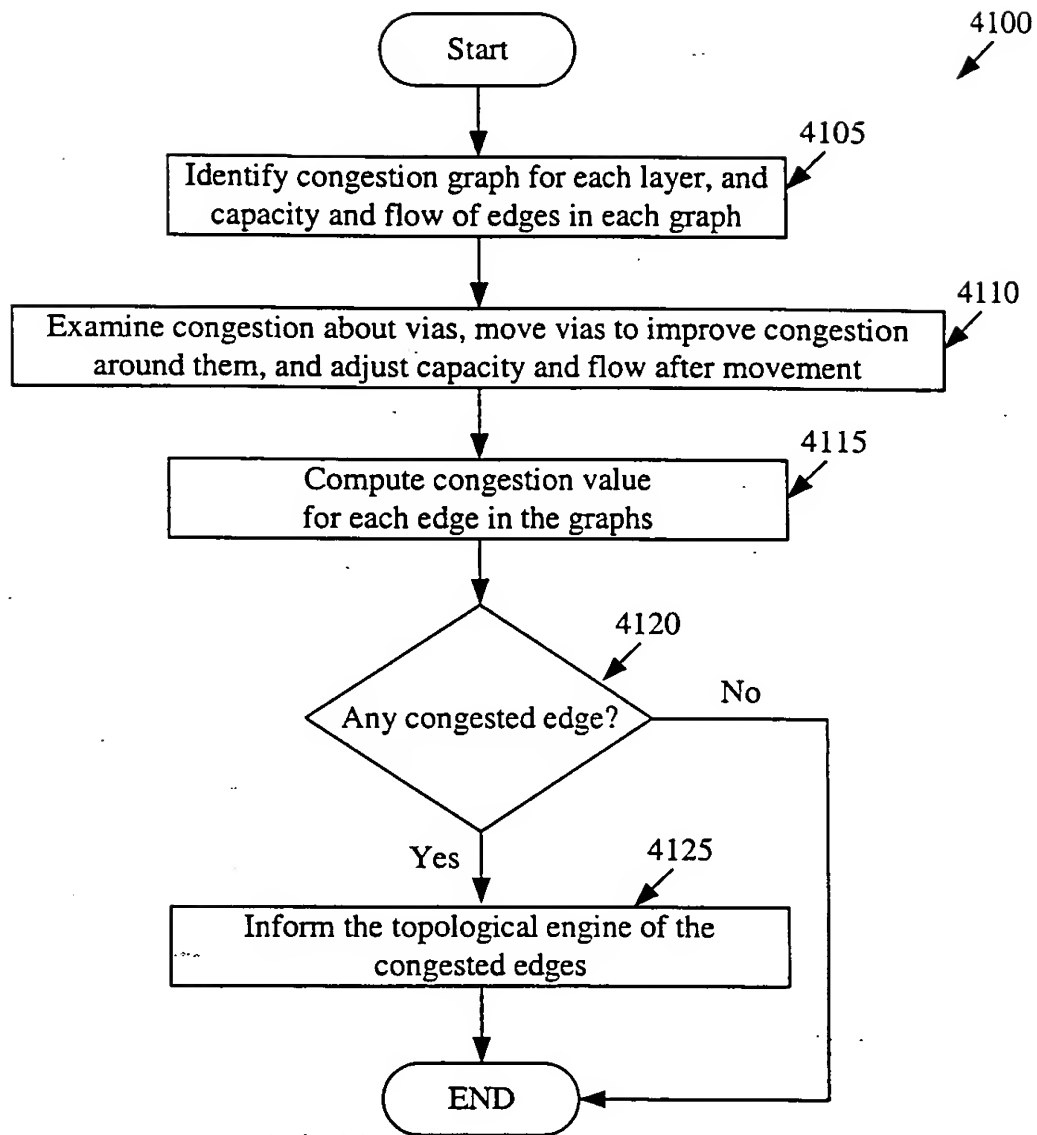




**Figure 39B**



**Figure 40**



**Figure 41**

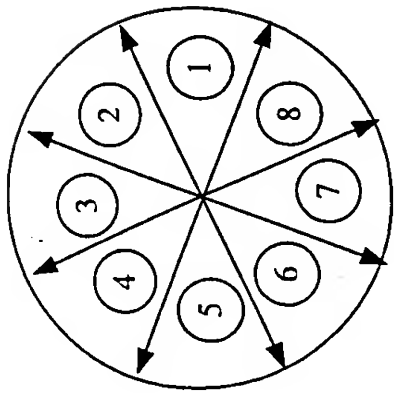


Figure 42

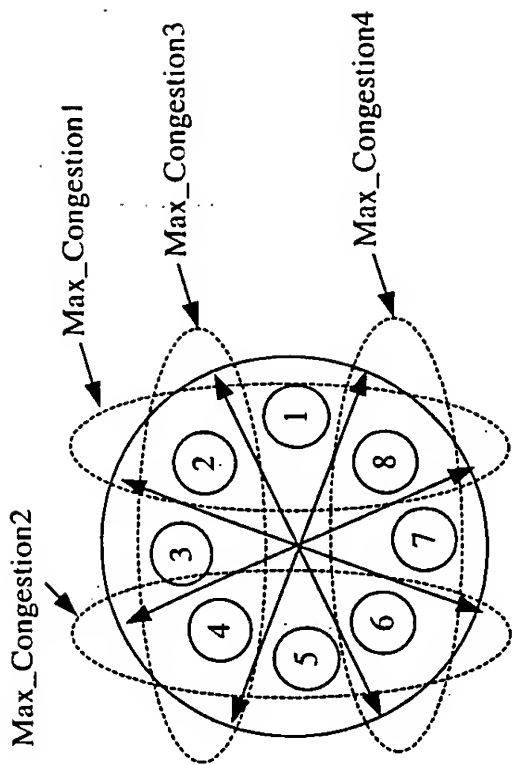


Figure 44

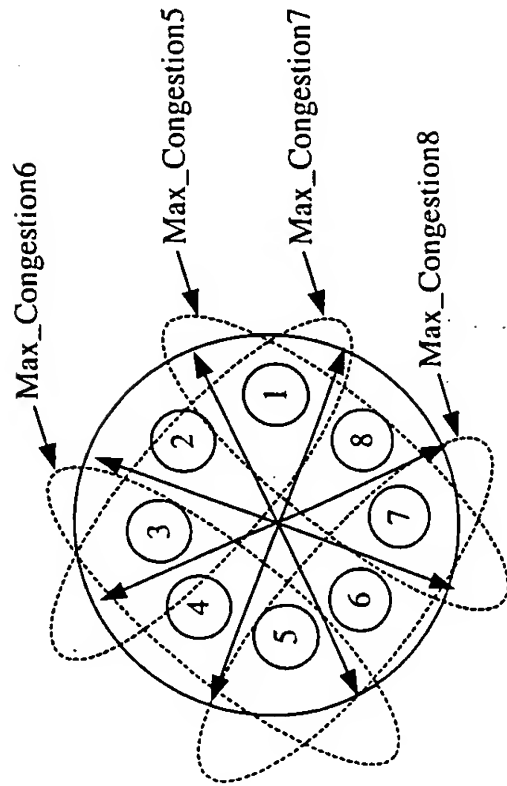


Figure 45

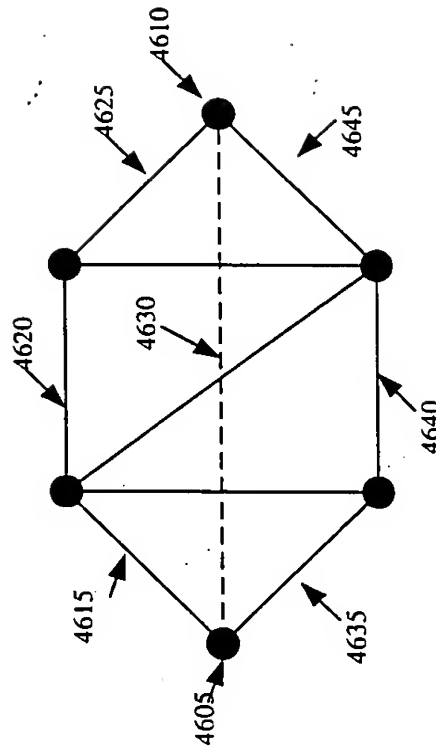
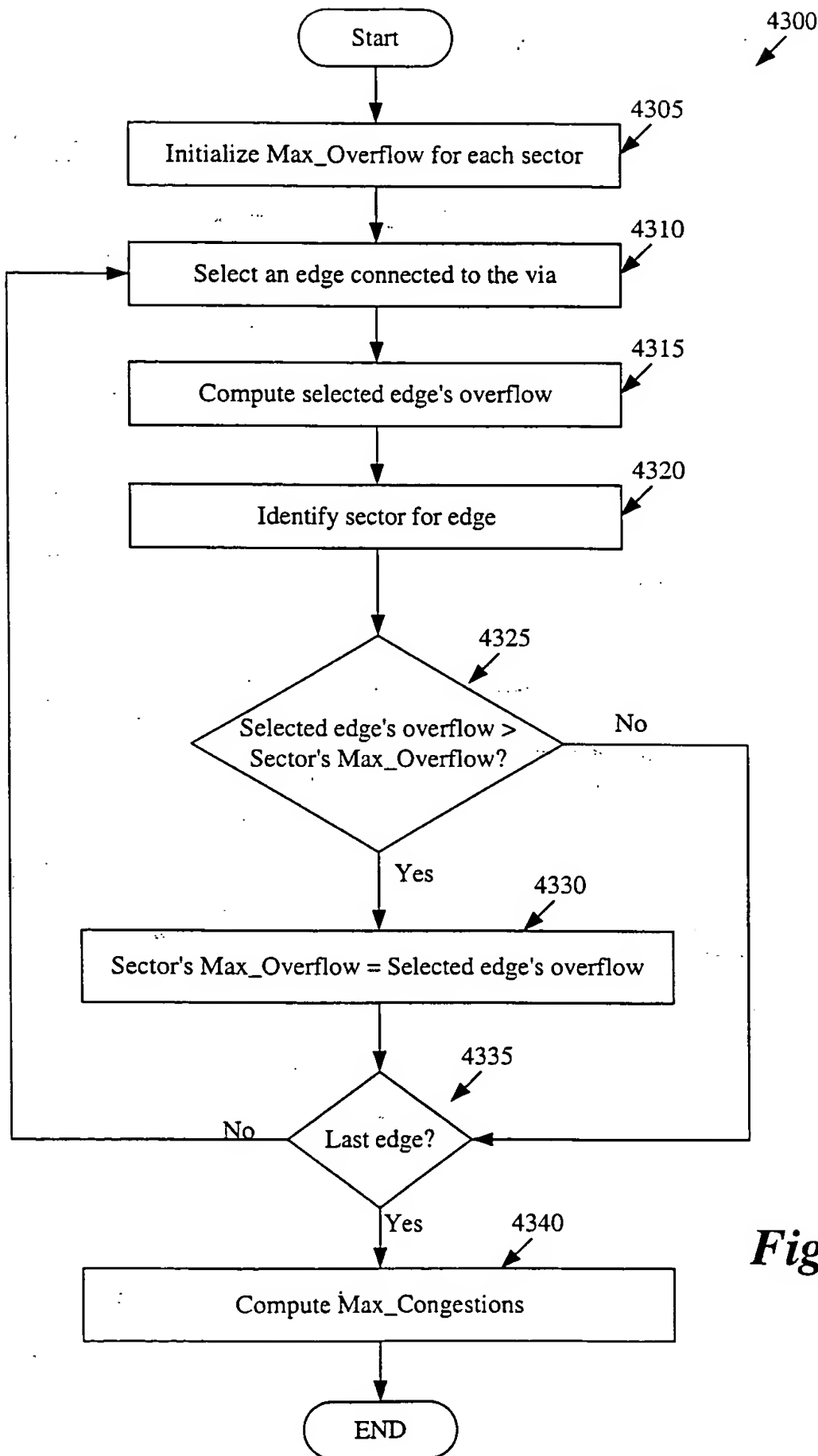


Figure 46



*Figure 43*

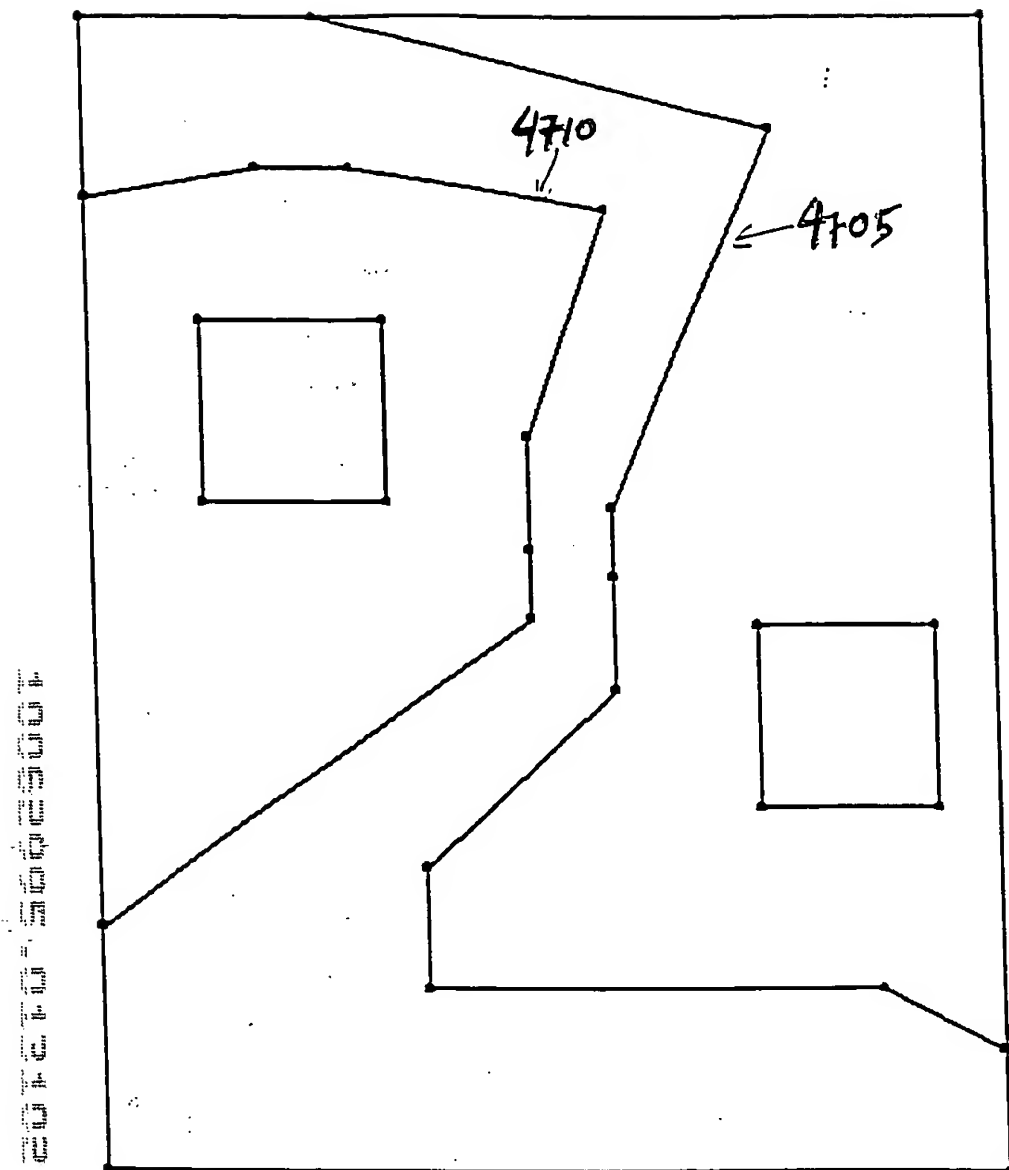


FIGURE 47



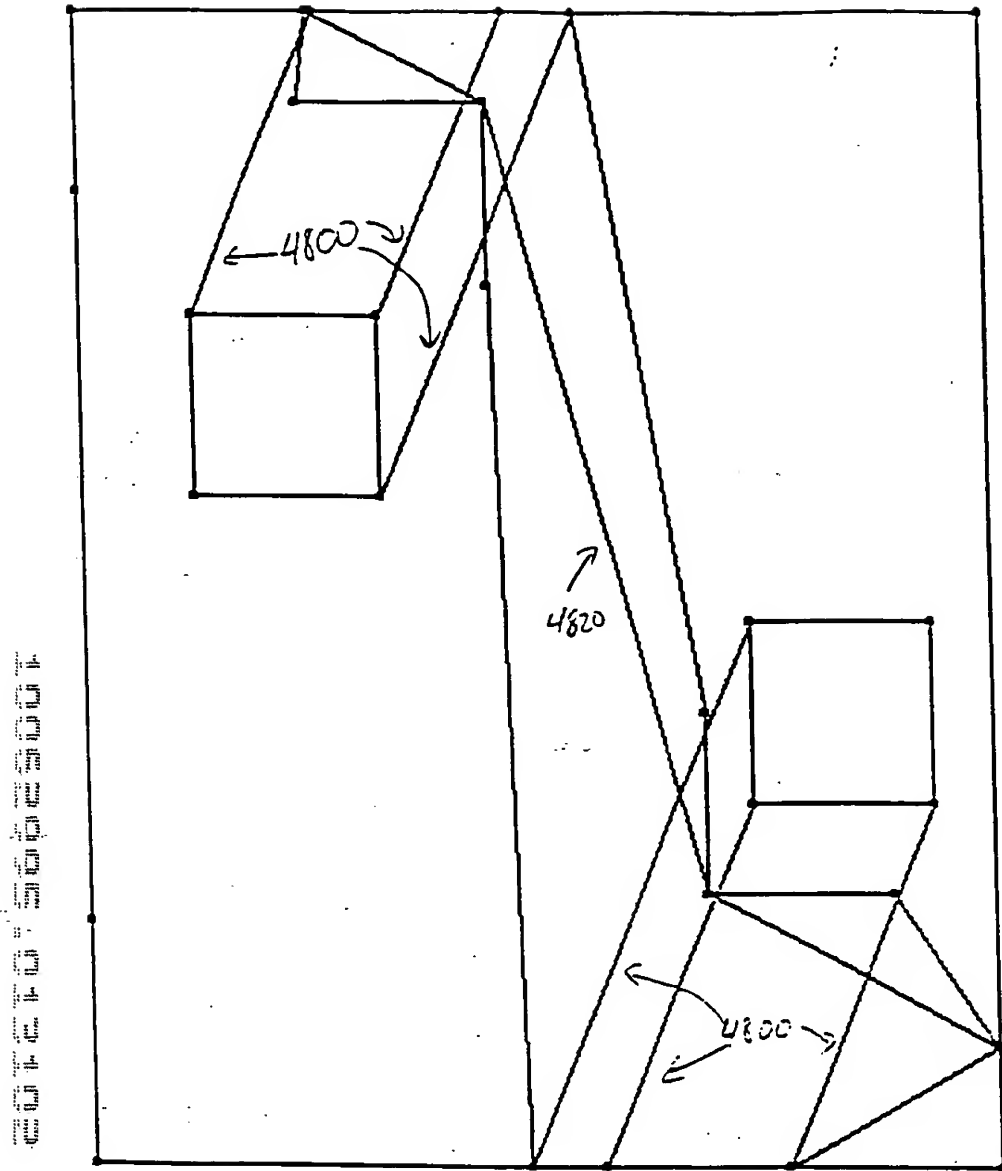


FIGURE 48B



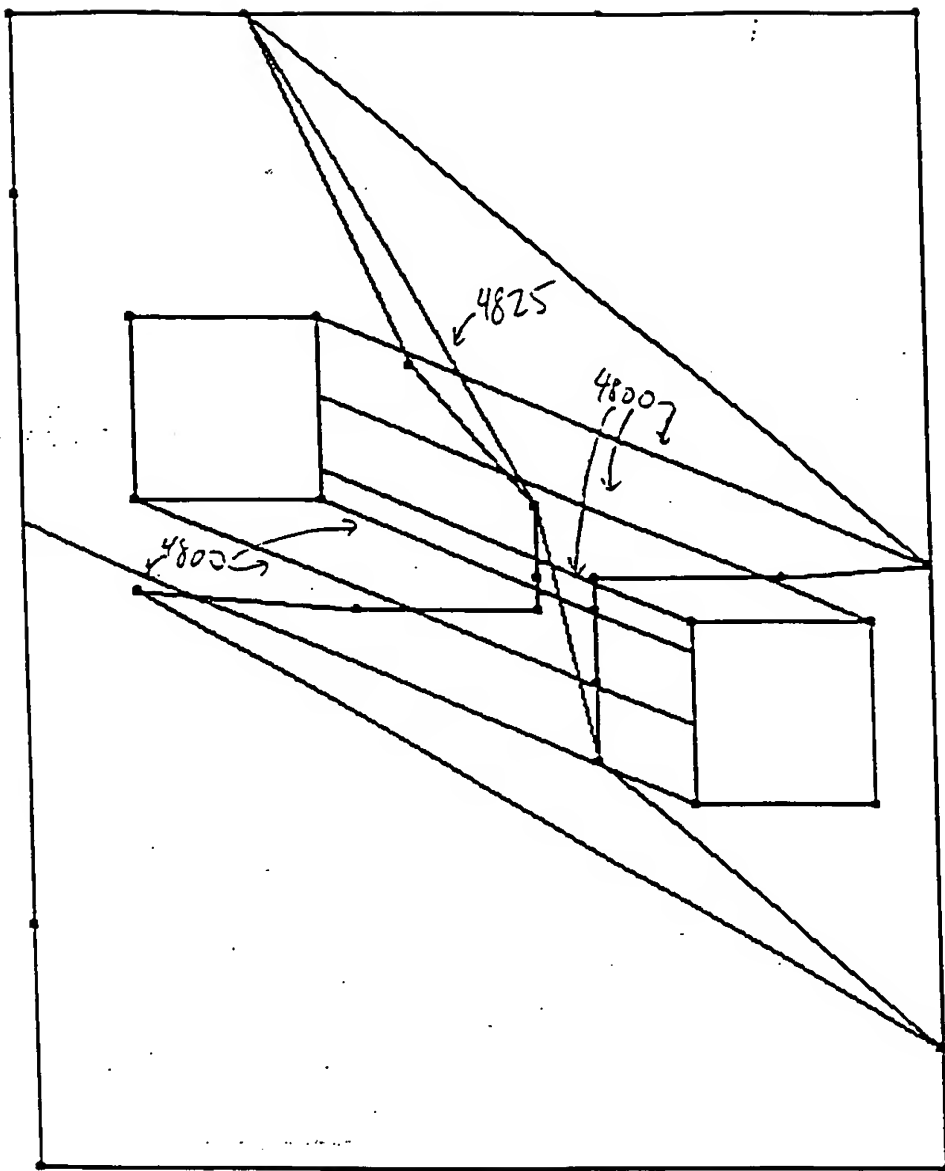


FIGURE 48C

FIG. 48D

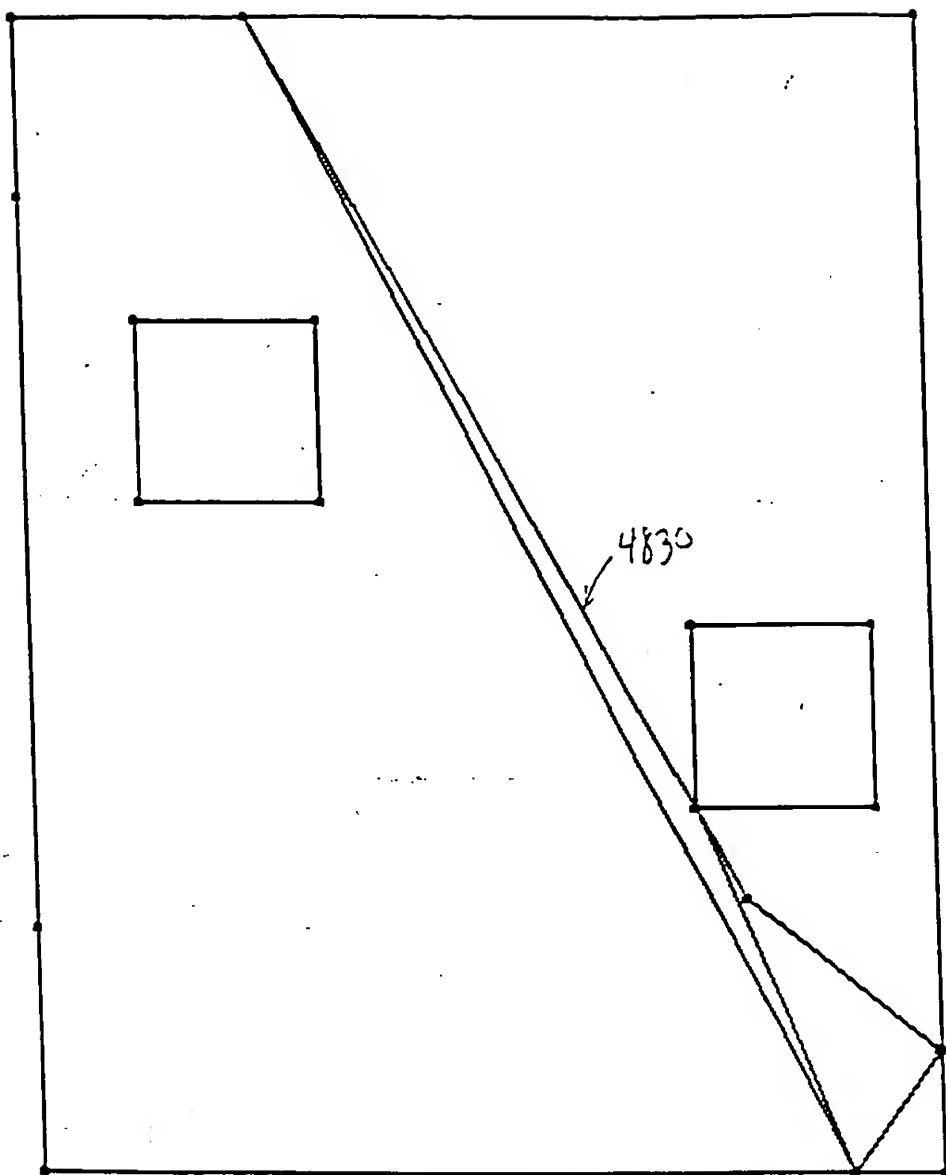


FIGURE 48D

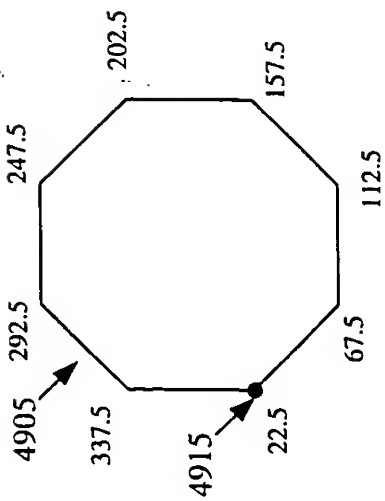


Figure 49A

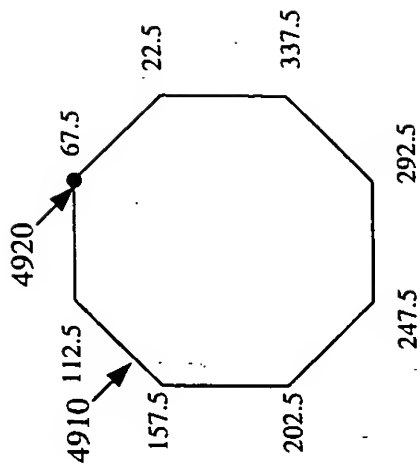


Figure 49B

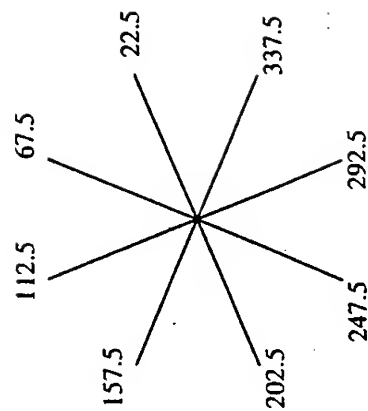
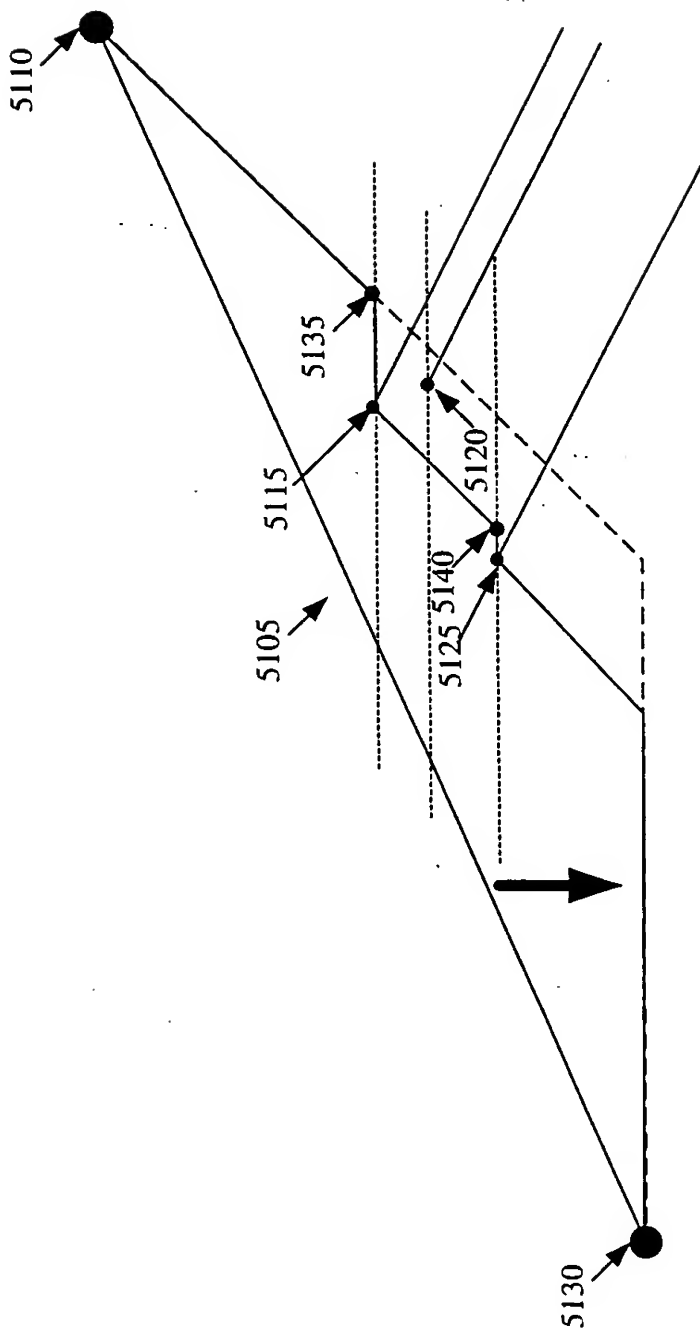


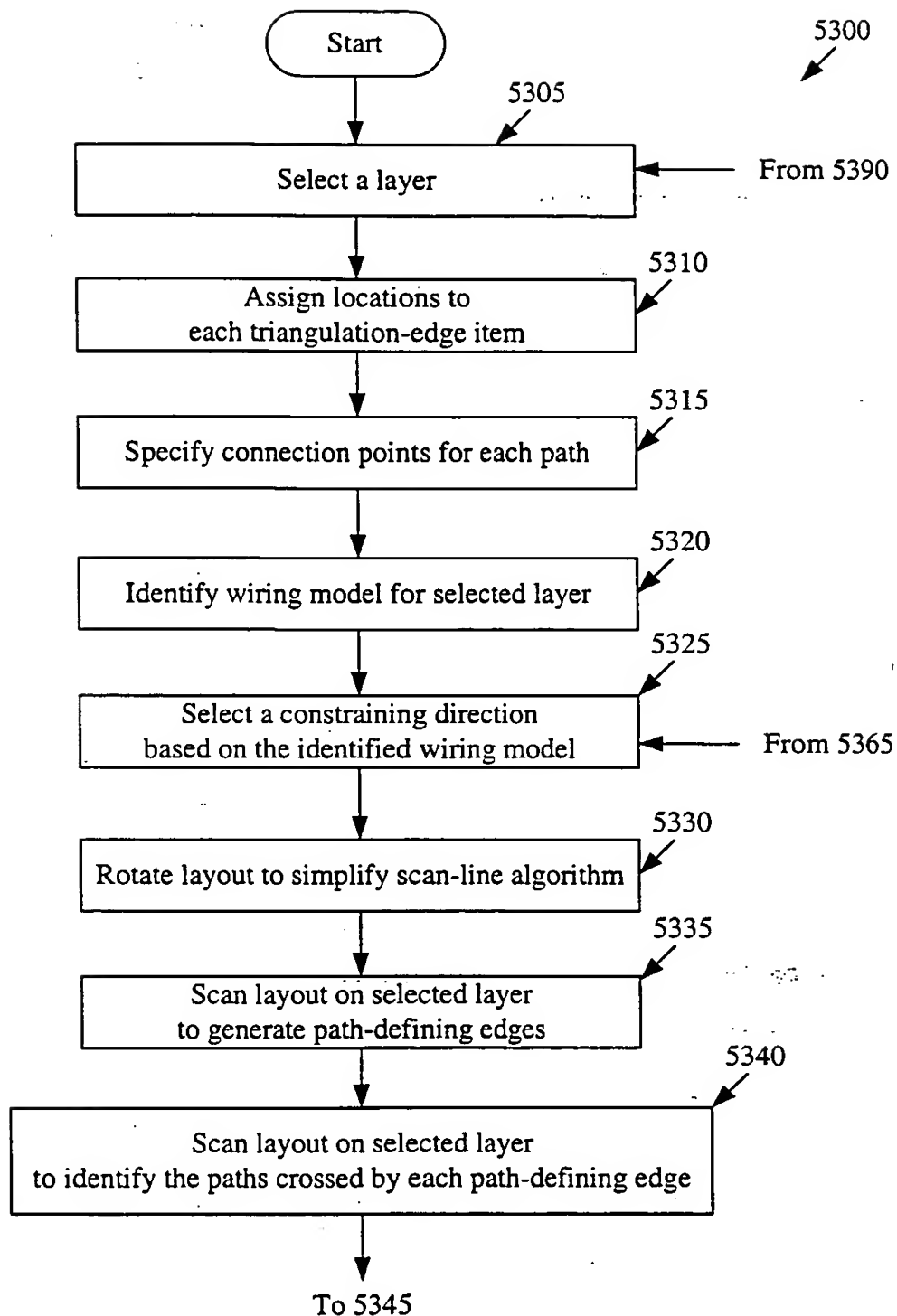
Figure 49C





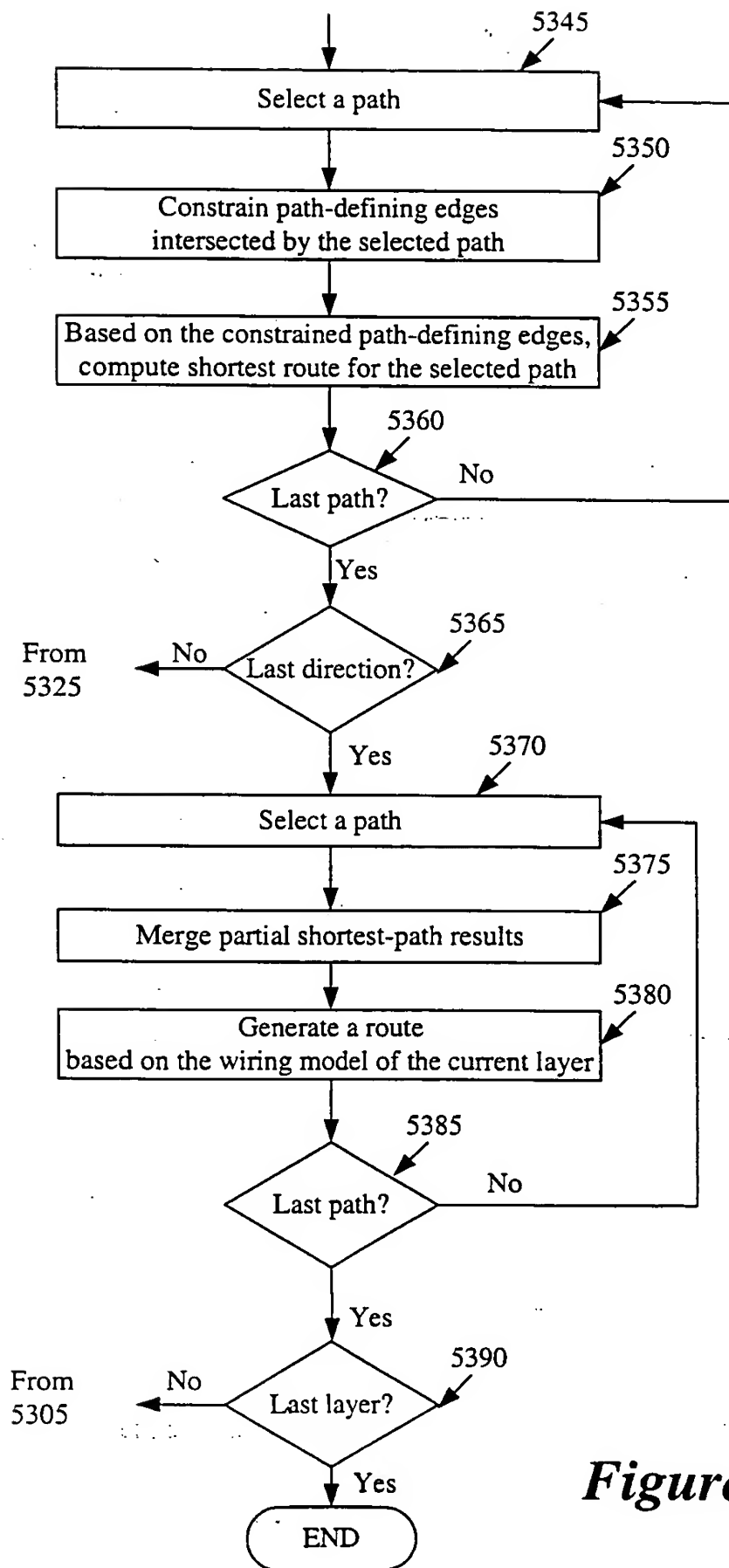
**Figure 51**





**Figure 53**

**Figure 53:** Figure 53A  
Figure 53B



**Figure 53B**



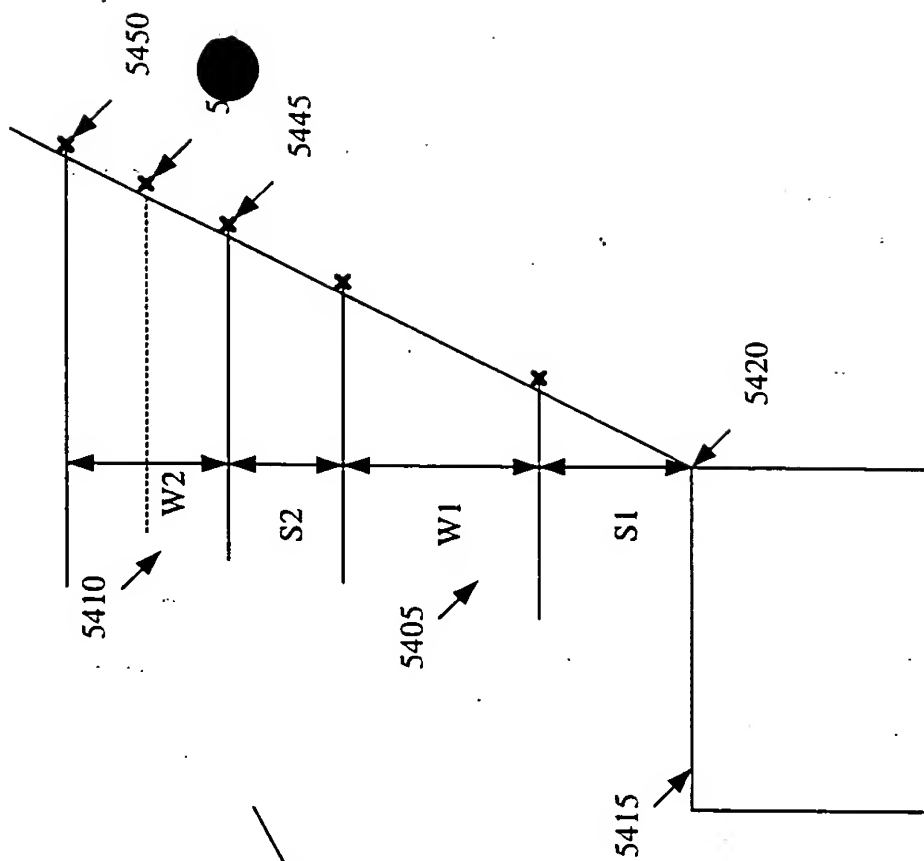


Figure 54

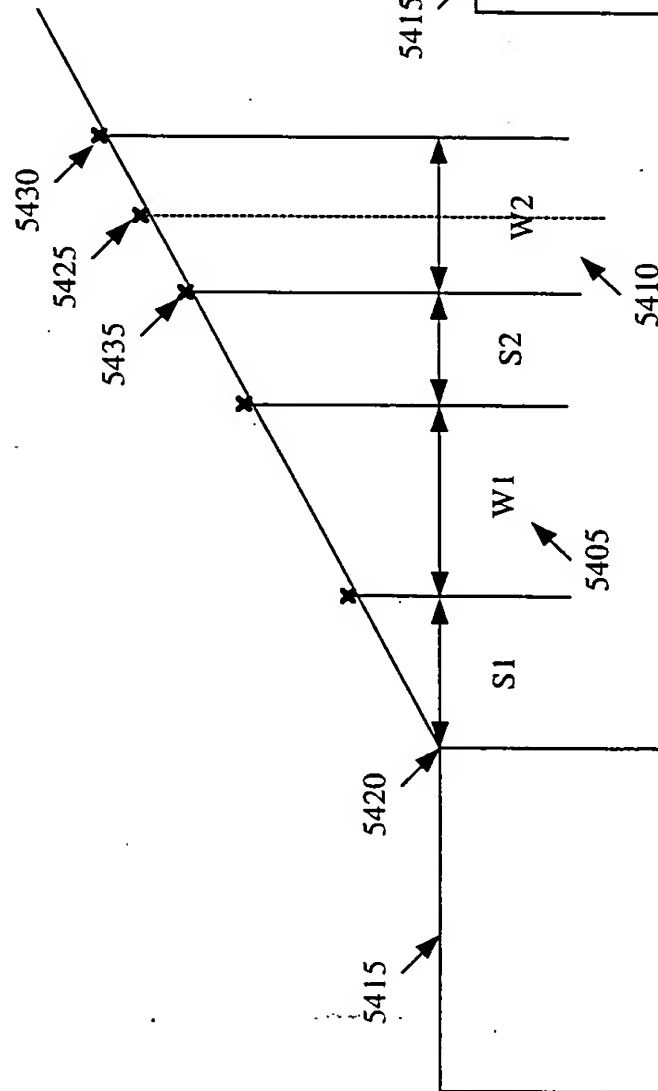
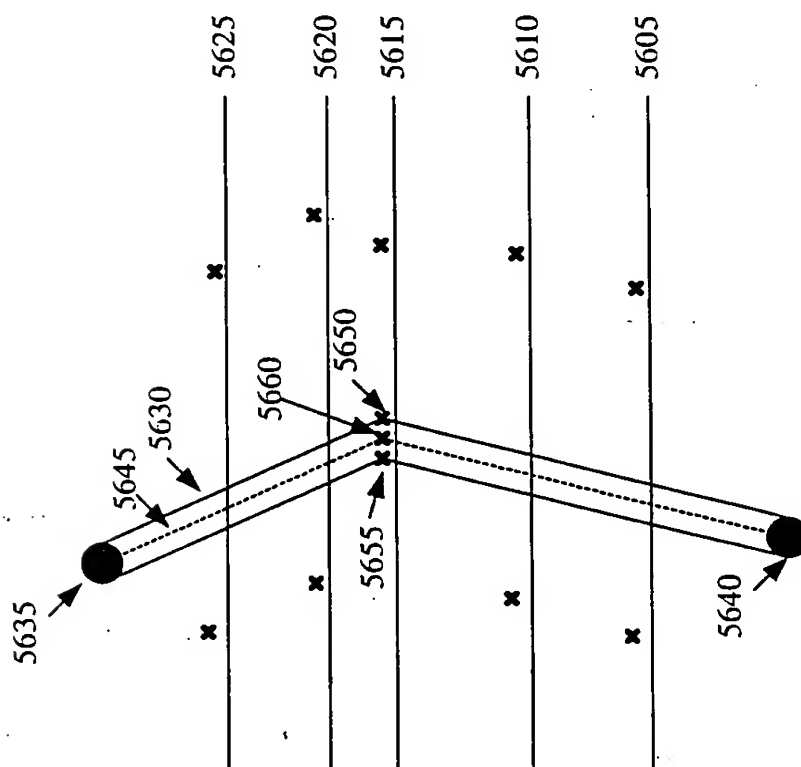
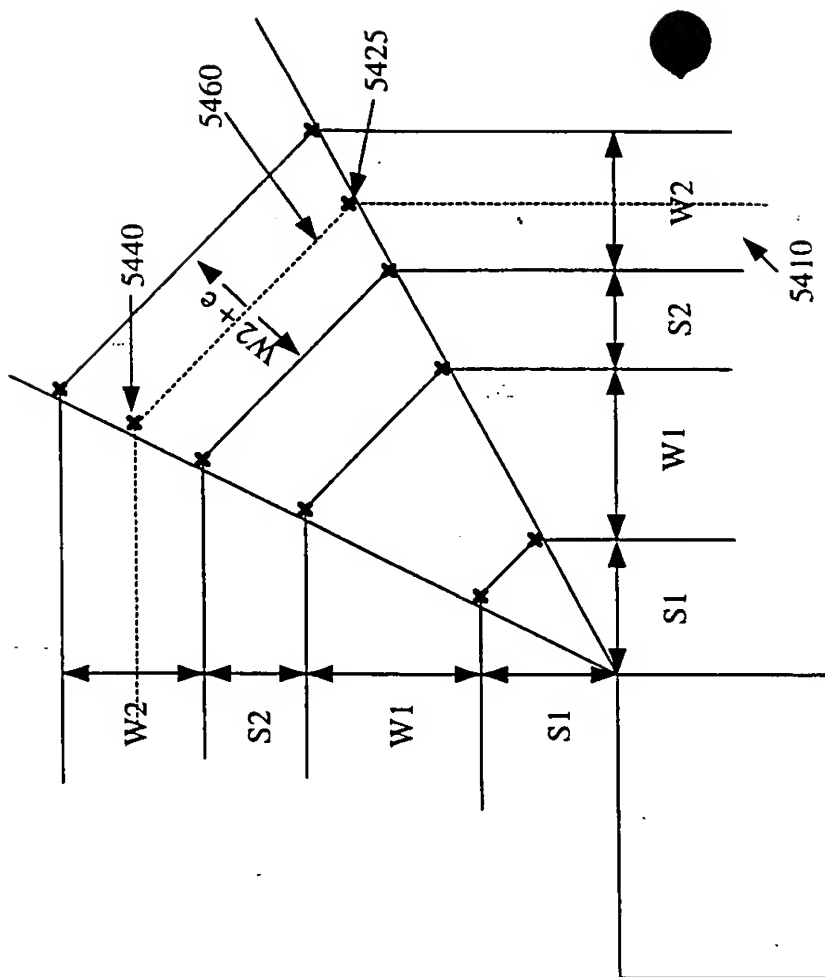


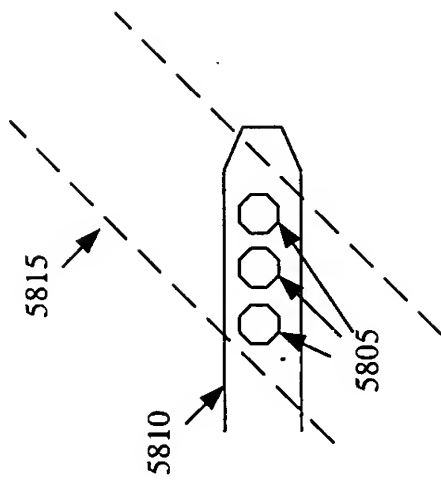
Figure 55



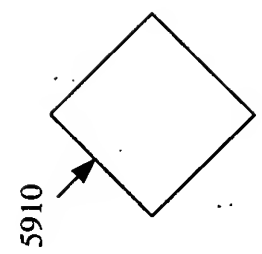
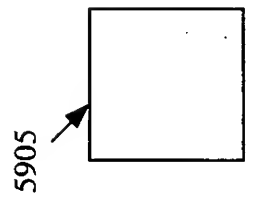
**Figure 56**



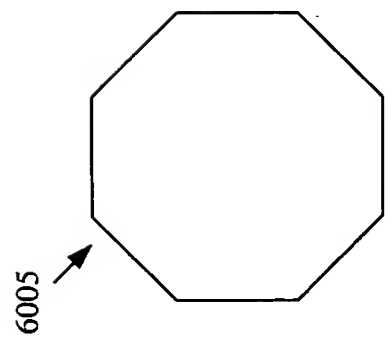
**Figure 57**



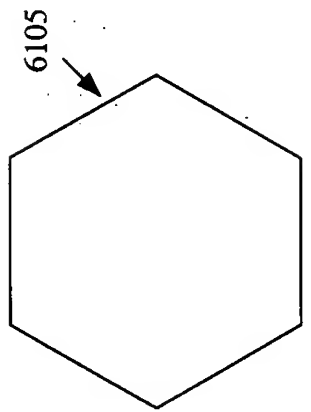
**Figure 58**



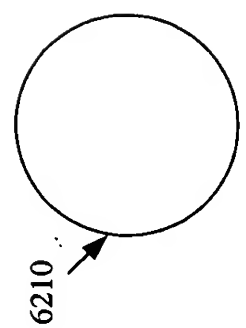
**Figure 59**



**Figure 60**



**Figure 61**



**Figure 62**

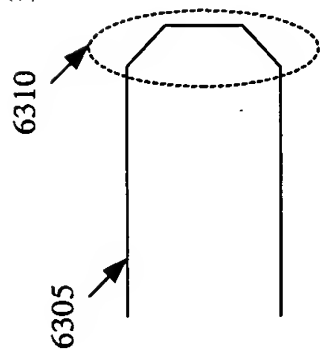


Figure 63

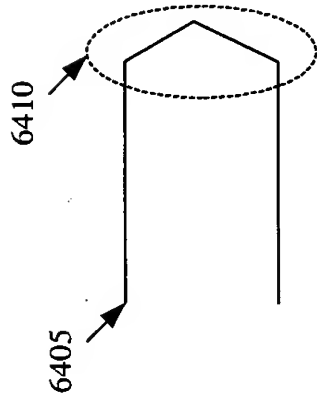


Figure 64

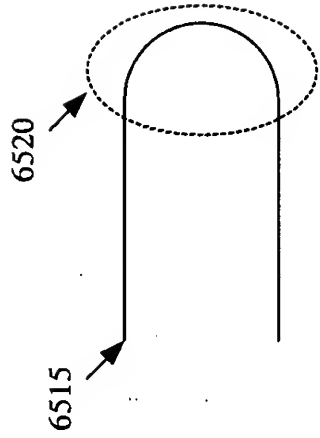
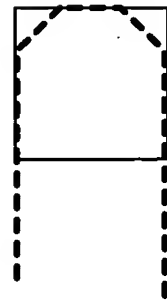
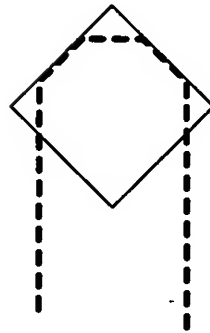


Figure 65

(1)



(2)



(3)

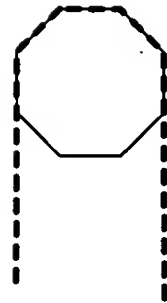
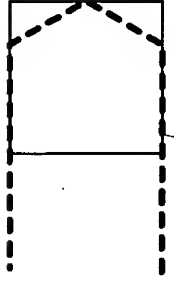


Figure 66

(1)



(2)

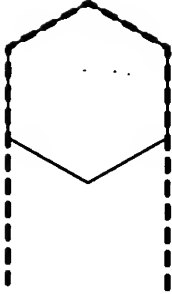


Figure 67

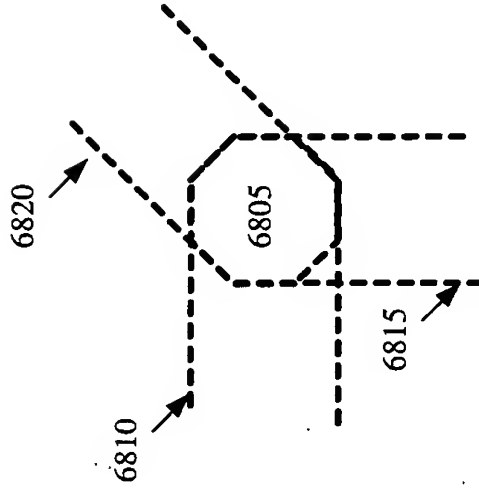


Figure 68

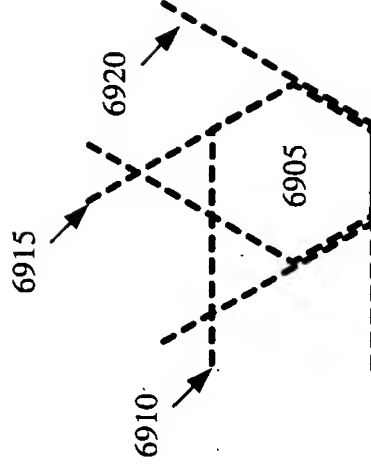
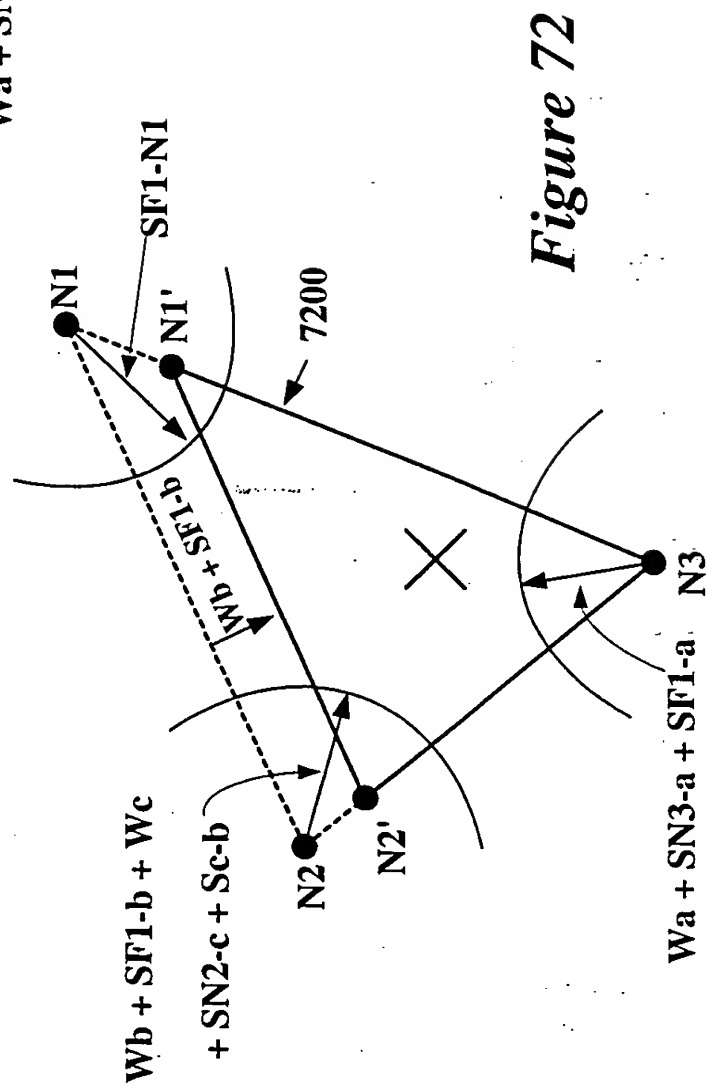
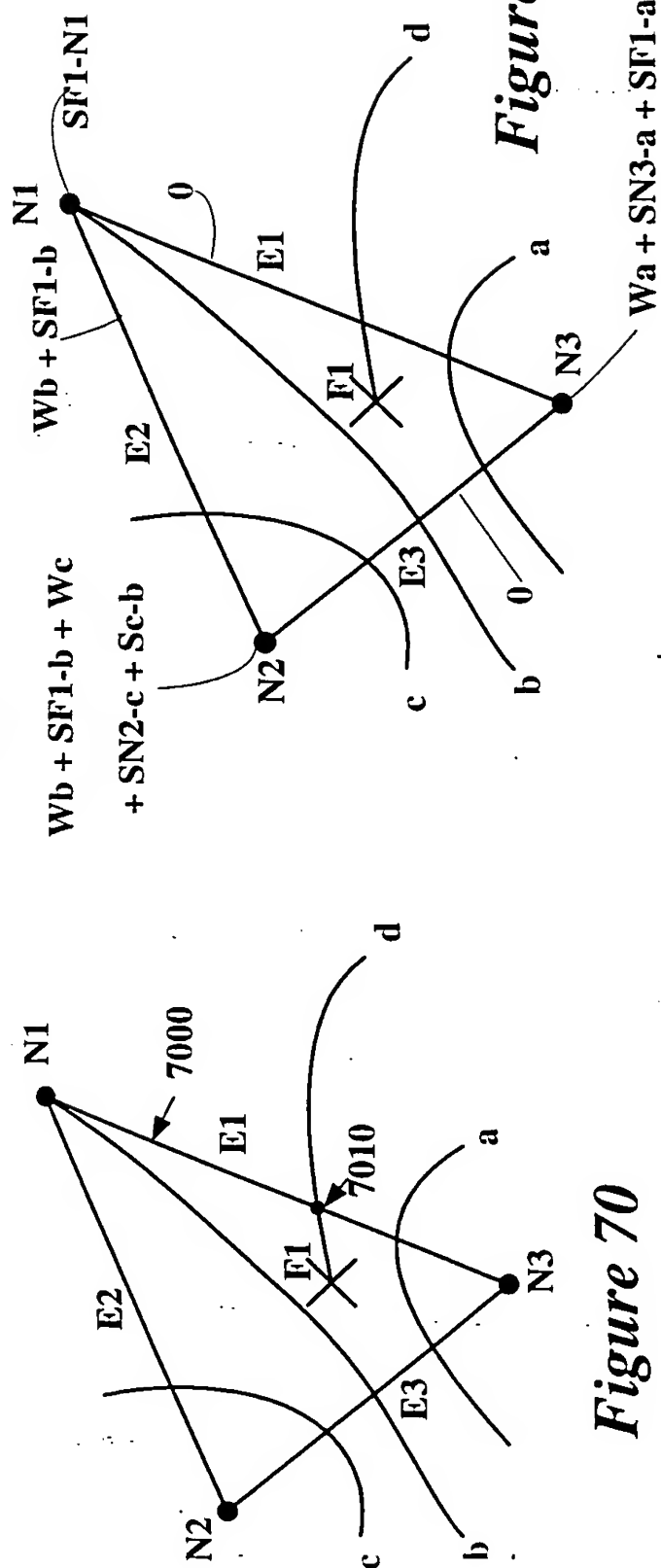
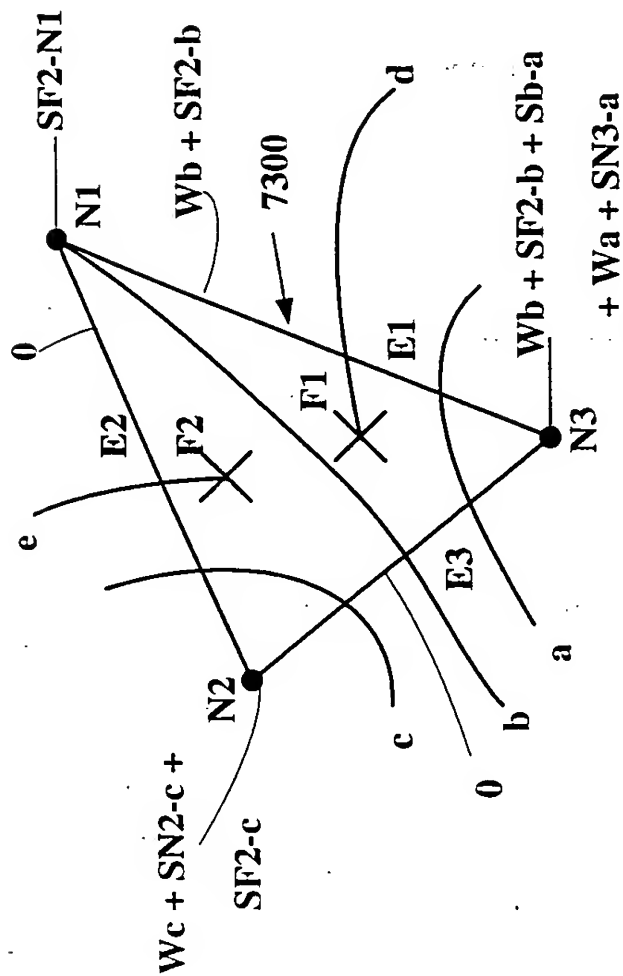
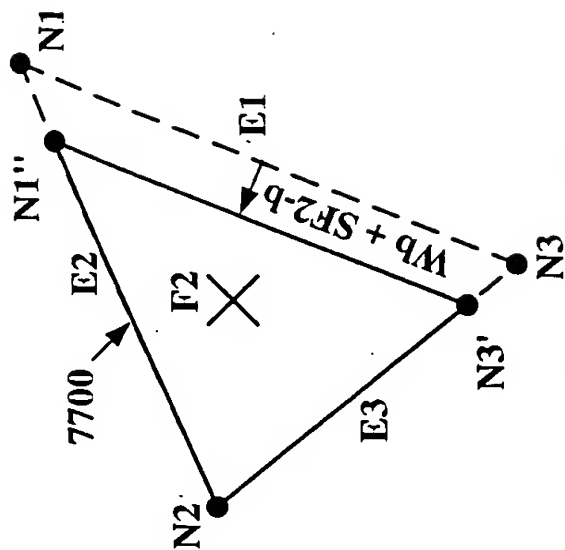


Figure 69

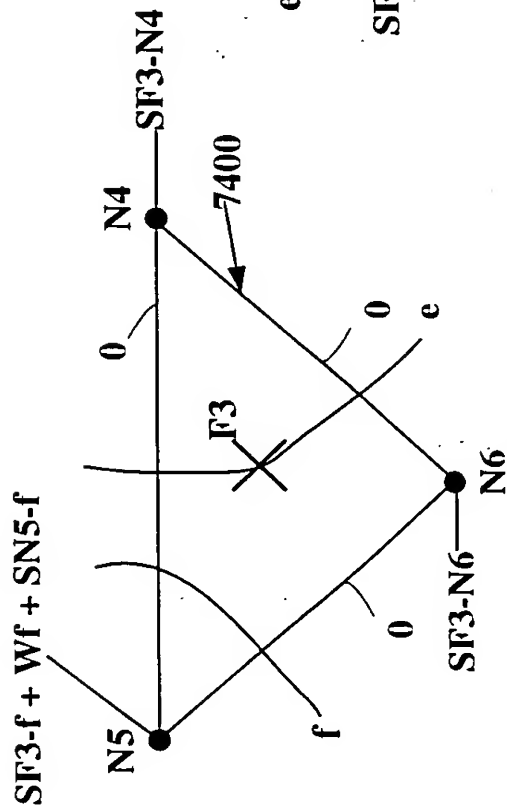


[illegible]

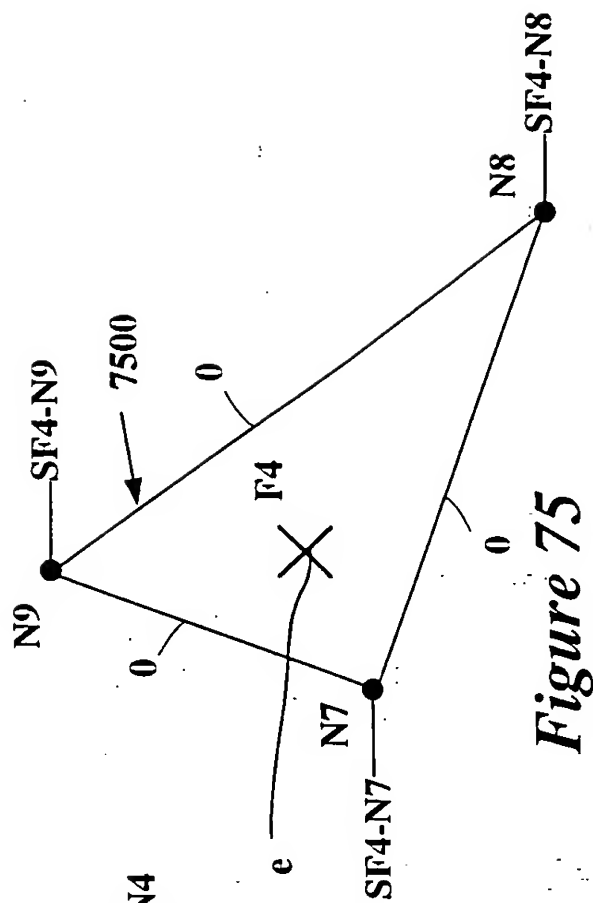
**Figure 73**



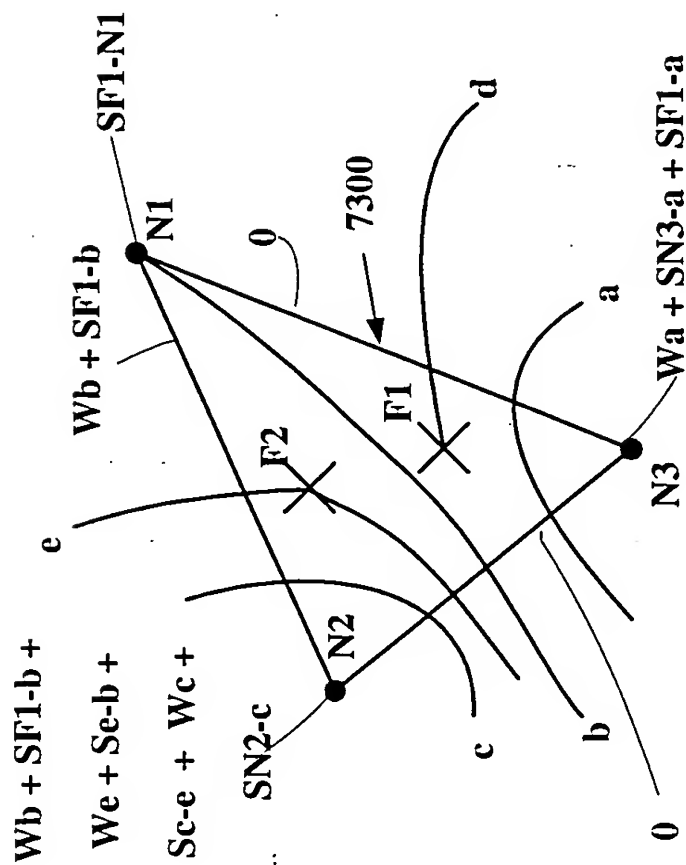
**Figure 77**



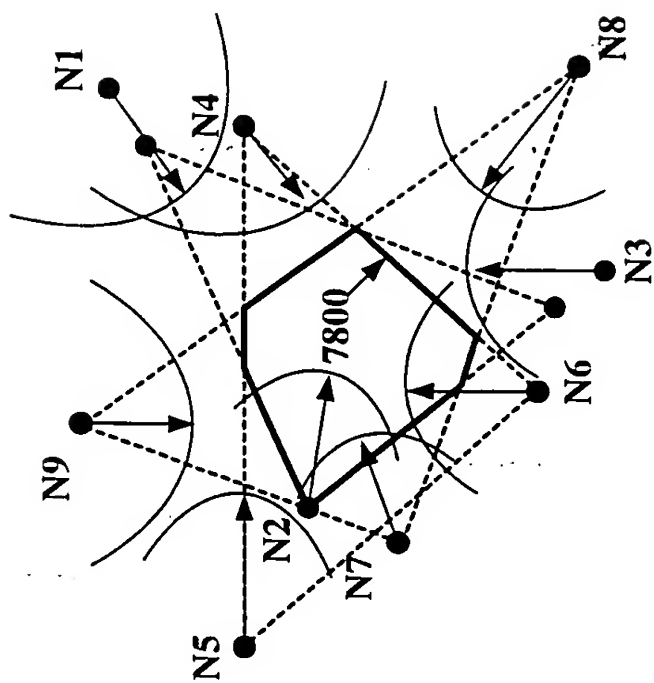
**Figure 74**



# Figure 75

[illegible]

**Figure 76**



**Figure 78**



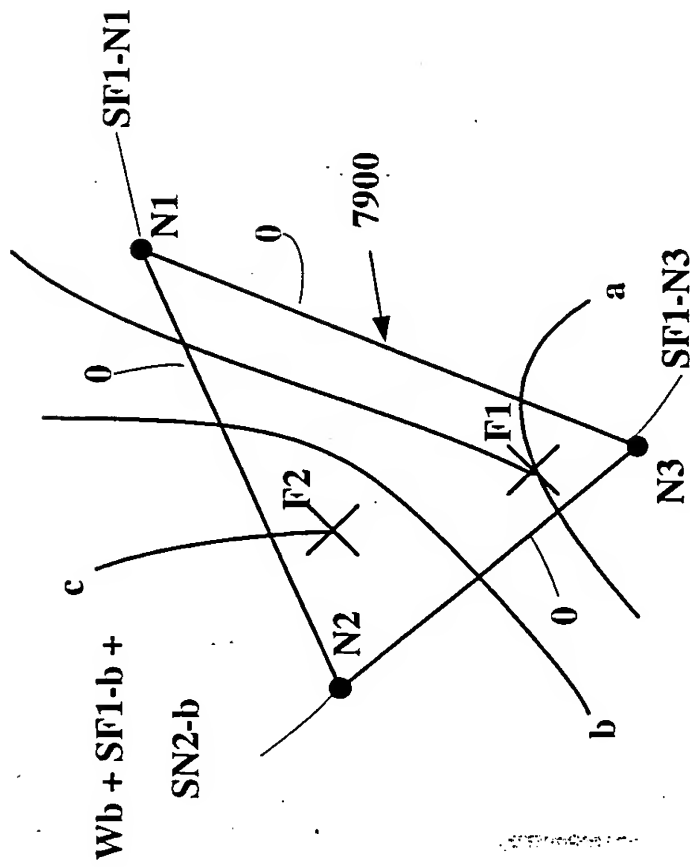


Figure 79

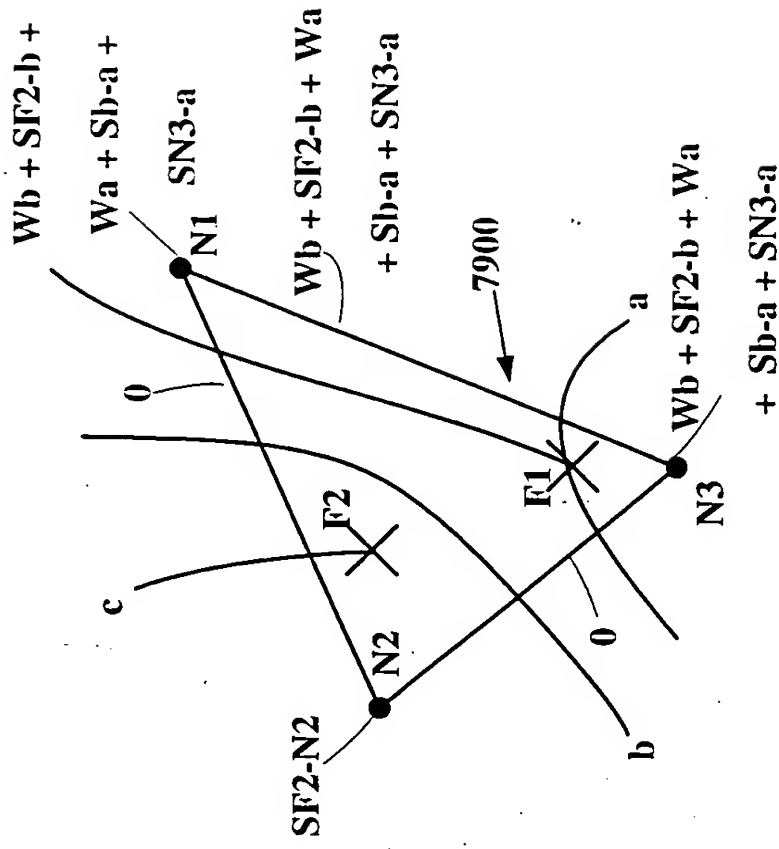


Figure 80

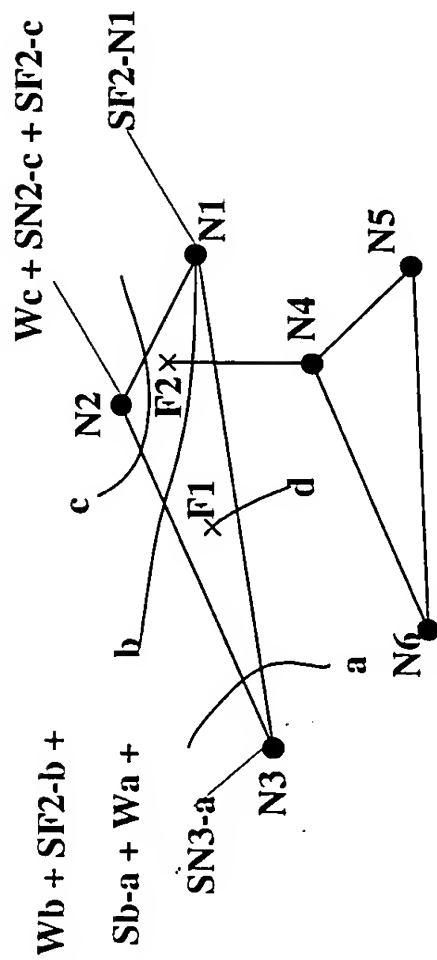


Figure 81

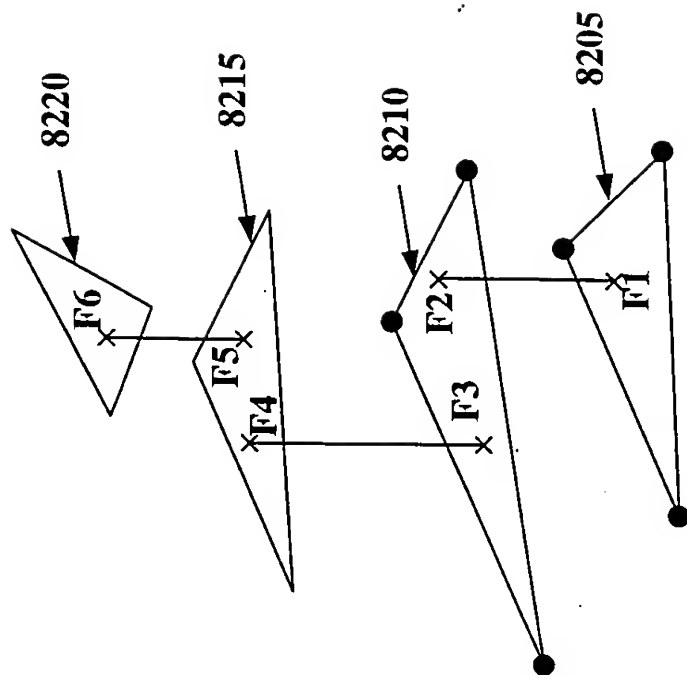


Figure 82

FIG. 83 is a block diagram of a system 8300.

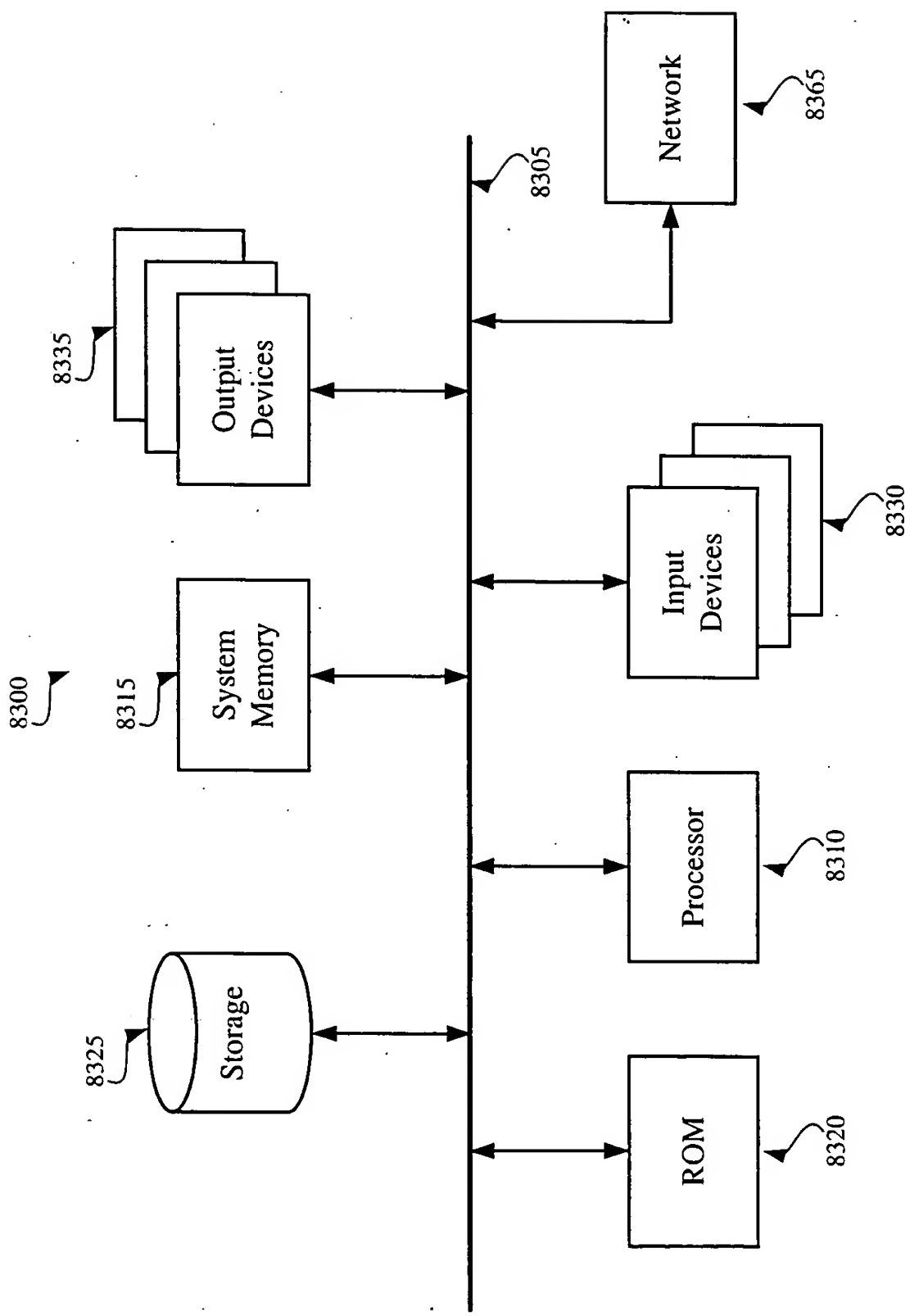


Figure 83